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FLOATING DRY DOCK FOR THE PHILIPPINES

The new floating dry dock launched last Saturday at Sparrow's Point and named Dewey will be put under tests in the Pawtucket river for two or three weeks. If its capacity is equal to the largest cruisers and battleships in the navy it will be put in condition for the voyage to the Philippines. No designation of ships for this test has yet been made. Admiral Endicott will make arrangements for the tests during the coming week. If the dock meets expectations it will be taken to Manila around Good Hope. The voyage probably will take five months. The dock will be taken to Olongapo instead of Cavite. This is done because it is the plan to retain Olongapo as a naval station in the event that the United States should decide to grant to the Filipinos their independence. Olongapo affords many advantages for complete equipment, with a good water supply and sufficient railroad communications when the proposed railroad system of Luzon is built.

This is the largest floating dry dock ever built, and the second which the Maryland Steel Co. has built for the United States government, the first having been in successful operation at Algiers, La., for several years. The contract for the Cavite dock called for the accommodation of a vessel of 16,000 tons, but the dock when completed will be capable of lifting a vessel of 24,000 tons, should vessels of that size ever be owned by our navy department. Like all floating structures, the bottoms of floating dry docks become foul with grass and barnacles, and in order to be able to keep it clean, this enormous structure has been built, like that preceding it, in three sections, a long and two shorter ones, the utility of this being that it will be able to dock, clean, and paint its sections itself. Nine thousand two hundred tons of steel were used in the construction of the dock, while nearly 500 men daily have been employed in its building.

Three 24-in. centrifugal pumps, the steam for which is furnished by three separate 225-H. P. Babcock & Wilcox boilers, will pump out or flood the dock. These pumps are controlled in the engine room. On the port side, forward, is the valve house, where there are twenty-four levers. The three sections of the dock are divided into sixty-four watertight compartments, and each of these levers controls the flooding and pumping of several compartments. A telephone gives communication with the boiler room and a pneumatic valve in the valve house announces the amount of water in the dock. its dimensions are 500 ft. long, 100 ft. wide between fenders, 134 ft. wide over all, 18½ ft. depth of bottom pontoon, and 63 ft. 8 in. high from bottom to top. The side walls are 14 ft. wide. Its construction was begun Aug. 27, 1903, and the contract called for its completion in 27 months. If nothing unforeseen happens, it will be ready about a month ahead of that time. The cost of the structure is something over $1,124,000, and its government supervision has been under Leonard M. Cox, of the civil engineer corps of the United States navy.

AMERICAN REGISTER FOR THE DAVENTRY

Eugene Tyler Chamberlain, commissioner of navigation, has just directed that American registry be given to the foreign built ship Daventry. The Daventry is a steel vessel built in England in 1889. On Dec. 22, 1901, the Daventry stranded on the south breakwater of the harbor at Charlestown, S. C., and $6,734.50 was spent in repairing her. On Jan. 20, 1903, the Daventry struck Frying Pan Shoal and certain expenses were incurred in salving the vessel. On Dec. 19, 1904, the Daventry stranded off Hunting Island lighthouse near Charlestown and $21,876.91 were incurred in repairing her. She was operated by her foreign owner until sold to an American citizen on Jan. 3, 1905, for $71,000. Commissioner Chamberlain held that the amount spent in repairs in American yards had equalled three-fourths of the value of the steamer and accordingly ordered that American registry be extended to her.

SHIP BUILDING DURING MAY

The bureau of navigation reports ninety-eight sail and steam vessels of 32,787 gross tons were built in the United States and officially numbered during May, 1905, as follows:

	Wood.				Steel.		Total.	
	Sail.		Steam.		Steam.			
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.
Atlantic & Gulf	24	1,545	33	1,011	2	2,872	59	5 428
Porto Rico	....	....	....	....	....	....	....	....
Pacific	1	10	12	2,166	....	....	13	2,176
Hawaii	....	....	....	....	....	....	....	....
Great Lakes	....	....	7	129	6	24,864	13	24,993
Western Rivers	....	....	13	190	....	....	13	190
Total	25	1,555	65	3,496	8	27,736	98	32,787

The largest vessels in the list were built on the lakes, the L. C. Hanna, E. H. Gary, James E. Davidson and Hoover & Mason.

The new tug now being built by Wm. E. Woodall & Co., of Baltimore for the James Clark Co. will be called Princess. She is 115 ft. long, 21½ ft. beam and 11 ft. molded depth and will have a fore and aft compound surface condensing engine with a cylinder diameter of 15 in. and 22 in. stroke.

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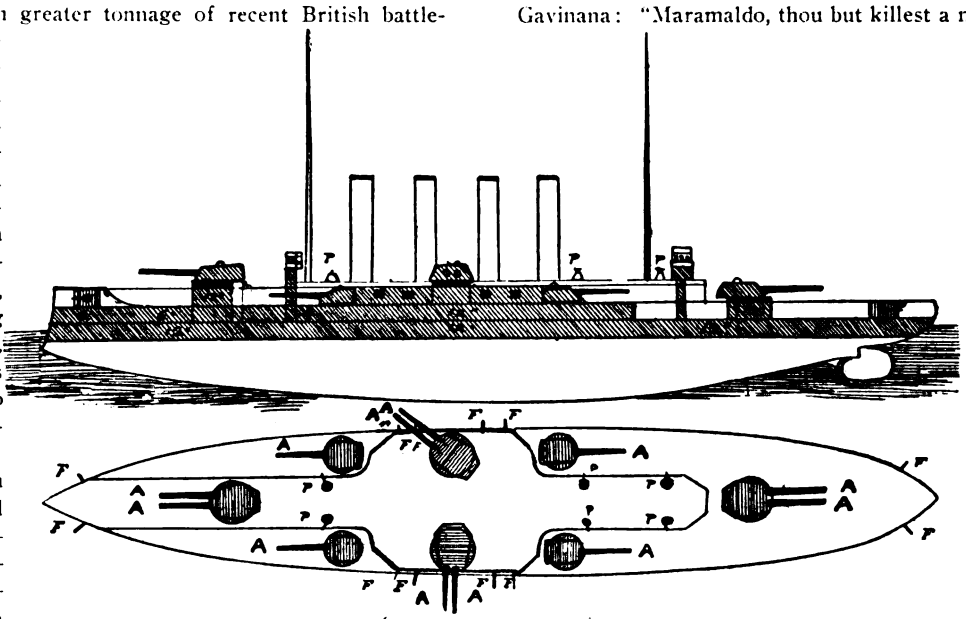
AN IDEAL BATTLESHIP FOR THE BRITISH FLEET

BY VITTORIO CUNIBERTI.*

Admiral Sir John Hopkins, late controller of the British navy, in his admirable article "Intermediates for the British Fleet," published in the last edition (1902) of this annual, asks what results it would be possible to obtain in the British navy by extending the ideas of the two Italian ministers of marine, Admiral Morin and Admiral Bettolo, which were translated into fact in the Vittorio Emanuele III (12,625 tons), so as to arrive at the much greater tonnage of recent British battleships, in the same manner as the ideas that found concrete form in the projected vessels of the Amalfi class were amplified and realized in the Italian battleship alluded to, and regarding which, even now, so many doubts are expressed as to such realization being practicable.



A—12-IN. GUNS; F—12-POUNDERS (ARMOR PROTECTED); P—DISMOUNTING POM POMS FOR NIGHT USE; 12-IN. BELT, 12-IN. TURRETS AND BASES, 12-IN LOWER DECK REDOUBT AND 6-IN. LOWER DECK FORWARD.

To proceed from 8,000 to 12,000, and from 12,000 to 17,000 tons of displacement constitutes not only a problem in naval architecture, but also involves high considerations of quite another nature, such as the special functions of the fleet, so as to harmonize with the political objects of any given maritime power, the geographical position of that power, the state of its finances, etc., etc. So that not only does the answer to such a question entail a certain amount of difficulty from the constructive point of view, but before the answer can be seriously considered it is absolutely necessary to determine exactly what end this ideal British battleship is to serve; for it is not to be imagined that we are going merely to enlarge the Vittorio Emanuele until we arrive at a displacement equal to that of the King Edward VII, merely to put an extra 4,000 tons on board to produce a vessel that will perhaps be a little steadier in heavy weather than the original ship.

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In Britain are to be found naval experts of the highest possible order, and they will have their own ideas as to what type of vessels best fulfil the needs and ideals of the British fleet, so that it would almost appear a presumption on my part to offer suggestions for any navy other than the Italian. But in deference to the courteous interrogation of Admiral Hopkins I may be permitted to point out that from the purely human point of view there are two leading methods by which one can strike to the ground one's opponent—either by gradually developing the attack and disposing of him little by little, or, on the other hand, killing him at one blow without causing him prolonged suffering. In like manner there are two distinct modes of sending an enemy's ship to the bottom.

Let us take for example a human combat. The first—the most commonly used, and the most practical in the majority of cases—has as its basis the progressive dismemberment of the enemy.

Two mortal foes place themselves on guard at a distance; they begin with experimental strokes, with feints, with opportune advances and retreats, never coming to close quarters for a deadly blow until the capabilities of the enemy, both offensive and defensive, are well tested, and until some fortunate stroke, even although not actually deadly, has considerably weakened the foe, has rendered his defense less able, and has somewhat demoralized him. Covered with blood, stunned, mutilated, and hardly capable of remaining on his feet, then comes the moment when his adversary closes in upon him and delivers the final and mortal blow. And we may almost imagine we hear the beaten one, with thick and choking voice, repeat the terrible words of Francesco Ferruccio at the battle of a Gavinana: "Maramaldo, thou but killest a man already dead!"

Similarly, two opposing ships, with but slight difference in their powers, will commence their combat at a great distance, utilizing their evolutionary abilities and their speed in prudent maneuvers, seeking to gain as much advantage as possible from their offensive and defensive powers, and attempting to place every obstacle in the way of the antagonist utilizing his powers in either direction. The discharge of projectiles will commence in earnest, greatly assisted by the rapid loading of which the guns of medium and small calibre are now capable. What results can reasonably be expected from the discharge of the smaller guns at such great distances is hard to say; nor can the slender expectation of, let us say, chancing to hit the captain of the opposing ship in the eye with a lucky shot, at all justify such a waste of ammunition. Gradually nearing one another, the ships maneuvering less freely, hits will become more dangerous; the boats that were not set adrift before the action began will be alight and burning fiercely; the cowls of the wind trunks, the funnels, and the masts will be in fragments.

The crew, wounded and reduced in numbers, will have lost their calm, and consequently the firing will have become wilder; finally, one of the two antagonists will get in a lucky shot that will disable the other. She will speedily become unmanageable, and her enemy will as speedily close in to within the thousand metres which will permit of a torpedo being launched with every chance of sucess, or the battle may be concluded by a final rush and the point of the ram. As the wounded hull sinks slowly beneath the waves, the flag which had put such heart into the crew, and the sight of which had spurred them to fight to the last, may well seem as it disappears to repeat to the enemy those sad words, "Thou slayest but one already dead."

Four ships in place of two, eight in place of four, will repeat in a perhaps more complex action the same phases of attack, and the same foolish waste of ammunition, which in these days causes the greatest preoccupation of those who, having to design warships, must decide on the quantity of ammunition and projectiles provided for each different calibre of the armament.

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There is, however, another method of fighting and sending your enemy to the bottom, but it is one that is capable of adoption only by a navy at the same time most potent and very rich.

Let us imagine a vessel whose armor is so well distributed and so impervious as to be able to resist all the attacks of an enemy's artillery with the exception of the projectiles of the 12-in. guns. Such a ship could approach her enemy without firing a shot, without wasting a single round of ammunition, absolutely regardless of all the "scratchings" that her antagonist might inflict on the exterior of her armor plates.

And as today the belts of fighting ships are generally of such thickness that, when we leave the results of the proving ground and come to the conditions of actual combat, we find that it would be more than difficult to penetrate them with 6-in. guns—we see at once that it would be useless to equip our contemplated ship with such artillery.

Further, if this ideal vessel which we have imagined to be so potently armored is also very swift, and of a speed greater than that of a possible antagonist, she could not only prevent this latter from getting away, but also avail herself of her superiority in this respect for choosing the most convenient position for striking the belt of the enemy in the most advantageous manner.

For this swift vessel a numerous and uniform armament of 8-in. guns, such as was contemplated for the Amalfi class,* would appear to be sufficient, if we had only to consider the penetration at right angles of modern belts, especially if capped projectiles are adopted.

If, however, the hit is an oblique one, and the distance is considerable, it appears necessary that we should adopt the calibre of 12-in. if we want to be absolutely certain of sinking the adversary, striking him *only* on the belt. But the loading of such guns is as yet very slow, although it has been greatly improved of late. Besides, the number of hits that one can get in on the belt itself is small. From this it appears that in our ideal and intensely powerful ship we must increase the number of pieces of 12-in. so as to be able to get in at least one fatal shot on the enemy's belt at the water line before she has a chance of getting a similar fortunate stroke at us from one of the four large pieces now usually carried as the main armament.

We thus have outlined for us the main features of our absolutely supreme vessel—with medium calibres abolished—so effectually protected as to be able to disregard entirely all the subsidiary armament of an enemy, and armed only with twelve pieces of 12-in. Such a ship could fight in the second method we have delineated. Without throwing away a single shot, without wasting ammunition, secure in her exuberant protection, with her twelve guns ready, she would swiftly descend on her adversary and pour in a terrible converging fire at the belt.

Having disposed of her first antagonist, she would at once proceed to attack another, and, almost untouched, to dispatch yet another, not throwing away a single round of her ammunition, but utilizing all for sure and deadly shots. A large and abundant supply of 12-in. projectiles and ammunition can be provided, in addition to the belt and the guns contemplated, out of the 4,500 tons of increase of displacement that will be disposable in the enlargement of the Vittorio Emanuele III to become the national British type of vessel in place of the King Edward VII.

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It will be necessary to defend our "invincible" with a thick complete belt of 12 in., and a battery also protected with 12-in. armor (for the redoubt must be thus defended as well as the water line, so as to eliminate the perils of the first system of attack sketched out, of progressive damages, being adopted against her); and at the same time she must be armed with twelve pieces of 12-in., arranged as in the Amalfi class or in the Vittorio Emanuele III., so as to be able herself to attack in the second method that has been outlined—that is to say, the system of the stronger, of the better defended, and most certainly that of the richer. But when a certain number of such colossi of 17,000 tons—six, for example—had been constructed, it is more than probable that the adversary would do his utmost to prevent their getting near him, and, fearful of the fatal result of so unequal a combat, would seek to betake himself elsewhere immediately on the appearance of the famous "invincible" division.

In that case the command of the seas, or a deluded belief that they have such command, will remain with these "invincible" ships, even although they may be of slow speed; but to stop at this point would be too little, and unworthy of the navy of the richest and most potent power in the world.

For this squadron or division, however "invincible," will not be really and truly *supreme* if it cannot also catch hold of the enemy's tail. The bull in the vast ring of the amphitheatre deludes himself with the idea that because he is more powerful than the agile toreador he therefore has absolute command of the scene of the combat; but he is too slow in following up his adversaries, and these almost always succeed in eluding his terrible horns.

We must therefore come to the conclusion that the type of vessel will not be absolutely *supreme* and worthy of such a nation unless we furnish it with such speed that it can overtake any of the enemy's battleships and oblige them to fight. Is it, then, possible to give to a vessel of 17,000 tons displacement: Protective armor of 12 in., twelve guns of 12-in. calibre, an abundant supply of ammunition, and a very high speed—superior to that of all and any existing battleships afloat?

* * * * * * * * *

It has been said and written—indeed, repeatedly written—that the Vittorio Emanuele III was a practical impossibility. But before long she will be actually in the water, and facts already show how vain were the suppositions and criticism of such croakers.

But it has also been asserted that in the case of this vessel surpassing the contemplated speed of 21½ knots on trial and attaining that hoped for of 22 knots, such would only prove that that particular tonnage of displacement especially lends itself to obtaining a form of hull with which we can realize a very high speed, and more so than with larger ships. This, however, is not quite exact. The law which governs the speed and displacement, other things being equal, is well known to all naval constructors, who have by heart the rule that whilst the displacement increases as the cube of the dimensions, the resistance, on the other hand, at a given speed does not increase in the same proportion as the displacement. The pith of the kernel lies in utilizing the most opportune dimensions, or rather, let us say, in adopting the special form of hull most adapted to those dimensions, more than in the actual amount of the displacement itself.

The amount of the displacement, however, is intimately bound up with the question of the defensive and offensive powers that it is wished to give to a ship; so that once the particular objectives of the Italian navy had been laid down, and thereby the defensive and offensive power to be sought for decided on, the question resolved itself into harmonizing them with a form of hull of the greatest possible efficiency, and this worked out at 12,600 tons. Nor does it appear that the problem could have been satisfactorily solved with a vessel of less displacement, as in that case it would have been impossible to realize the required power, while with a greater displacement the ship would have been incapable of obtaining the desired speed.

* The vessels of the *Amalfi* class designed by Col. Cuniberti in 1899 were of 8000 tons displacement: they were to have been armed with twelve 203-m/m (8-inch), twelve 76-m/m (12-pounders), and twelve 47-m/m (3-pounders). The armor belt was 152m/m (6 inches) thick, as also was the armor of the battery and of the turrets. The engines were to be of 19,000 H. P., and the speed with 15,000 H. P. was to be 22 knots.

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In the same manner the defensive and offensive power of the projected ships of the Amalfi class was harmonized with a form of hull of such high efficiency that it would have been possible to obtain a speed of 23 knots and probably more; but the statement that the problem could not have been solved with a displacement of much less or much greater tonnage than that projected, is not to be taken as insisting that the solution must be interpreted in a too absolute manner, asserting that the speed of 23 knots could not be efficiently obtained save with a displacement of from 8,000 to 9,000 tons, for this would be inexact.

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If now the question be put: Is it possible for such and such a naval architect to design a special form of hull having a displacement of 17,000 tons, and with which we can realize a very high speed—24 knots, for example?

"Without doubt," will answer all practical naval constructors.

If we go further, and ask: Is it possible for him at the same time to arm such a vessel with twelve pieces of 12 in.?

"Without doubt," will answer but a certain number of such experienced men.

But if we go still further, and demand finally: Is it also possible for him to protect such a ship with 12 in. armor?

"Without doubt," will answer only one here and there who may have already made researches in that direction.

And as the solving of such a problem necessitates many and many a calculation, and no amount of discussion or argument on the matter could in any way be conclusive unless based on definite plans and figures, these lines might well conclude here.

But, in deference to the courteous inquiry of Admiral Hopkins, this brief article must not be allowed to close in a manner so indefinite.

I would therefore say frankly at once that the designs for such a vessel have already been worked out, and that its construction seems quite feasible and attainable. Following up the progressive scale of displacements from 8,000 to 12,000, and then on to 17,000 tons, a new King Edward VII has been designed, 521½ ft. (159 metres) in length, with a beam of 82 ft. (25 metres), and mean draught of 27 4-5 ft. (8.5 metres); with the water line protected with 12-in. plates, and the battery similarly armored; having two turrets at the ends, each armed with a pair of 12-in. guns, and two central side turrets high up (similar to the two with 8-in. guns in the Vittorio Emanuele III), also armed each with two pieces of 12-in., and four turrets at the four angles of the upper part of the battery, having each one 12-in. gun.

This vessel has no ports whatever in her armor; she carries no secondary armament at all, but only the usual pieces of small calibre for defense against torpedo attack.

The speed to be realized, as proved by the tank trials, is 24 knots.

FREE TRADE ECONOMICS CORRECTED

Editor Marine Review.—About the disposition of the administration to purchase abroad supplies for the Panama canal, and to buy two steamers for the route via the Isthmus, I would like to say a few words on the principle involved. The papers have it today that "the war department announced that it would give the preference to American markets where there was no wide divergence in price." While this is different from giving it out that supplies—vessels included—would be bought in the "cheapest" market, the principle is the same. It is further said that "the administration has read with amusement" that either the president or Secretary Taft, intends to back down from their unpatriotic position—for the reason, no doubt, that they think they are right. *But are they right?* Is it a sound proposition, that the administration is at liberty to buy supplies abroad without the authority of law, or under the stress of necessity? It is not only the dictates of patriotism, that it is not warranted in its position, but it is the fact, that the course proposed violates the rights of every citizen whose trade is involved in furnishing the supplies in question, and the two steamers wanted.

It is no favor at all that is asked of the administration to buy in the American market. Our friends, the manufacturers, and our friends, the ship builders of the United States, only demand their *rights* when they insist that it is *their* business to furnish the government with supplies and vessels of all kinds. It could only be a privilege that foreigners may take the place of citizens and furnish anything whatever for the consumption of the United States government. The right forever abides with the men whose lives, fortunes and happiness are at the call of government on occasion. Before the Revolution George Washington, then loyal to the king of Great Britain, sent for his best suits of clothing to England. After he became president and had come to hold allegiance to the people of the United States, he quit patronizing British tailors. There is not a biographer of Jefferson that does not tell of his patronage of the clothmakers and tailors of his own countrymen. Is it imagined that this conduct was dictated by a disposition to play to the galleries? to court the applause of the "mob"? Nay, my friends, but it was intended to teach a wholesome lesson of ethical philosophy—the *right* of the people of America to the patronage of the people and the government of America.

There is not a locality in our country where the right of the people of the place is not recognized as to furnishing supplies for consumption at that place, say to build a private or public work, or to employ labor on the same. For instance, the admirable state house at Denver, Colo., is entirely of material from the quarries and building resources of the state. It was the right of citizens to furnish it—no thanks to the building committee for favors. No contractor has a right to bring in foreigners to take the places of our citizens, in executing a piece of work. A law of congress will not permit ship builders, say Cramp & Sons, of Philadelphia, to import from the Clyde the labor for building the steamers wanted for the Panama line; and because they cannot furnish steamers as cheaply as Clyde builders, then the administration will revenge itself by contracting with the Scotch! This is a nice piece of ethics, verily!—an affront to the American people. It is free trade run wild. It is the proposition of men much miseducated. Why, the veriest tyro in a labor union should be able to understand so simple a thing as, that it is the *sacred rights* of a people of any country to do the work for the government of that country.

WILLIAM W. BATES.

GROUNDING OF SCHOONER MASON INVESTIGATED

The United States lake survey steamer Search has completed an investigation of the grounding early in May of the schooner R. P. Mason, in Green Bay above Cedar River, Mich., on a reef alleged to extend one-half mile farther from shore than shown by the lake survey chart north end of Green Bay. From fishermen it was learned that the schooner struck the outer end of the rock reef about five miles northeast of Cedar river, and which extends easterly from the point just south of the mouth of Little Cedar river. The schooner is said to have been among boulders with only about 3 ft. depth over them, and it would appear that she grounded in about the position of the rocks designated on the chart of north end of Green Bay, boulders 3 to 4 ft. under water being found on this point of the reef. A careful resurvey in the vicinity shows that the lake survey charts are very accurate both as to the location and extent of this reef. There is deep water just outside and nothing further was found on which the Mason could possibly have struck.

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LAKE UNDERWRITING

Buffalo, June 12.—It is pleasant to find that there is one branch of the lake trade, at least, that still has hopes of making a profit this season—the underwriters. Of course that is not saying that the vessel owners as a body will not come out ahead of their expenses, though it is pretty certain that quite a percentage of the small craft will have a hard job to do so, especially if they are not suited to carry ore. And then if the ore happens to be all carried before the end of the season it will make it impossible to get a good rate on grain to save the season on. The first spurt in lumber is over and it may be months before there is much revival, which drives as many of the barges to ore as are able to do anything in that line.

The insurance situation is peculiar, but not so distressingly bad as it promised to be a month ago. Even now there are plenty of bears in the business who declare that the early losses have made it impossible to catch up, even with the lakes as calm as a mill pond till winter, for there are the fires and collisions and at least a part of the strandings that will not depend much if any on weather conditions. It now looks as though the first estimates of losses in the ice were overstated, though it will never be quite known how that is, for there are vessels coming into dry dock right along with a series of unreported accidents to be looked after all at once to save dock charges and time.

So it always happens that one season runs into another pretty badly when it comes to reducing losses to figures. Of late, though there have been no losses of much significance unless it be on lumber, Tonawanda being just now the center of that sort of thing. The underwriters have not lost so badly on lumber of late as they used to, but the history of the business is such that the side companies that tried it are mostly out now, with a good reason for it. Lumber insurance rates are about all in the cargo list that have not suffered this season from competition, which shows as always that good sharp losses are necessary to the insurance business as they are to the building trades, either in ships or houses. A certain lake line in Buffalo carried its own hull insurance for a number of years and the manager boasted that he had laid up more than enough to buy a new steamer, but when after awhile a steamer of the line was lost the company returned to hull insurance.

There has been a great amount of competition in lake insurance this season, both in hulls and cargoes. The rates on coal and ore early went very low on that account, but somehow the hull rates did not break, the competition being mostly between agents, who seem to have been content in this case to use their own profits in the warfare. So for once at least the vessel owner has been made the beneficiary at the direct expense of the insurance agent. There seems to have been a wholesome notion with the agents generally that it would not do to slash hull rates very promiscuously. It somehow has come about that there is now American capital enough in the business to cover all risks, but that is not saying that the London underwriters are consenting to such an arrangement.

Apparently it is not known just what the temper of London in this regard is and it would not be so very safe, perhaps, to find out by doing something not relished over there. It is well known, though, that London is much worried over losses in the eastern war, so many merchantmen have been picked up, so that the attention has been turned away from the poor lake trade and its fleet for the present. What would happen, even now, should the local capital make a move looking towards the absorption of the business is not exactly known, though nobody seems to be really anxious to find out, at least till the local insurance capital is much stronger than it is or is able to get along much better than it has been doing, for if it should be able to cut loose and escape any consequences on account of London turning at bay and doing something radical, there would not at present be anything gained, for rates would remain perhaps as low as they are now.

So it appears to be the proper thing from all points of view to go on for the present in the same line that has been pursued. It is not a very comfortable state of things, for with just the proper amount of strength and not enough to permit arbitrary action, the underwriters could insist on some regulations, such as insisting on not bucking ice, that would be of great account to all branches of the trade and would enable the underwriters to live on rates that are considerably lower than can be made as things are now.

JOHN CHAMBERLIN.

SUMMARY OF NAVAL CONSTRUCTION

The monthly summary of naval construction, issued by the navy department, credits the New York navy yard with having surpassed the Newport News Co. in the construction of the competing battleships Connecticut and Louisiana. The Connecticut leads by a trifling percentage. Following is the summary:

Name of Vessel.	Building at.	1905. Per cent. of completion. May 1.	June 1.
	BATTLESHIPS.		
Virginia	Newport News, S. B. & D. D. Co.	85.53	87.33
Nebraska	Moran Bros. Co.	70.89	72.4
Georgia	Bath Iron Works	77.78	80.01
New Jersey	Fore River Shipbuilding Co..	81.1	84.8
Rhode Island	Fore River Shipbuilding Co..	86.	87.6
Connecticut	Navy Yard, New York.	73.56	77.73
Louisiana	Newport News, S. B. & D. D. Co.	74.83	77.55
Vermont	Fore River Shipbuilding Co..	47.2	51.1
Kansas	New York Shipbuilding Co..	51.4	54.
Minnesota	Newport News, S. B. & D. D. Co.	63.18	65.42
Mississippi	Wm. Cramp & Sons	27.04	29.09
Idaho	Wm. Cramp & Sons	24.93	27.18
New Hampshire	New York Shipbuilding Co..	3.2	7.2
	ARMORED CRUISERS.		
West Virginia	Newport News, S. B. & D. D. Co.	100.	
California	Union Iron Works.	75.	76.2
Maryland	Newport News, S. B. & D. D. Co.	99.95	100.00
South Dakota	Union Iron Works	72.9	74.
Tennessee	Wm. Cramp & Sons	71.80	75.73
Washington	New York Shipbuilding Co..	74.2	76.3
North Carolina	Newport News, S. B. & D. D. Co.	3.25	6.03
Montana	Newport News, S. B. & D. D. Co.	3.20	5.32
	PROTECTED CRUISERS.		
St. Louis	Neafie & Levy S. & E. B. Co.	63.	65.3
Milwaukee	Union Iron Works	72.4	73.8
Charleston	Newport News, S. B. & D. D. Co.	93.78	94.98
	GUNBOATS.		
Dubuque	Gas Engine & Power Co.	94.28	99.4
Paducah	Gas Engine & Power Co.	83.9	85.4
	TRAINING SHIPS.		
Cumberland	Navy Yard, Boston	95.	95.
Intrepid	Navy Yard, Mare Island	97.5	97.5
	SCOUT CRUISERS.		
Chester	Bath Iron Works		0.
Birmingham	Fore River Shipbuilding Co...		0.
Salem	Fore River Shipbuilding Co...		0.
	TORPEDO BOATS.		
Goldsborough	Wolff & Zwicker	99.	99.
O'Brien	Lewis Nixon	99.	99.
	COLLIERS.		
Erie	Navy Yard, New York.	0.	0.
	SUBMARINE TORPEDO BOATS.		
Sub. T. B. No. 9	Fore River Shipbuilding Co...		0.
Sub. T. B. No. 10	Fore River Shipbuilding Co...		0.
Sub. T. B. No. 11	Fore River Shipbuilding Co...		0.
Sub. T. B. No. 12	Fore River Shipbuilding Co...		0.

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DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

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JUNE 15, 1905.

Considerable purchases of steamers for the Japanese have recently been made in Britain. Were the United States a ship building country as it should be, undoubtedly a fair proportion of these purchases would be made in the United States. But the United States will never be a ship building nation until congress removes the handicap which it has imposed upon ship building in this country. It can only remove it by extending the policy of protection to cover ship building or else to abolish it in all other industries. All that ship building is asking for is a chance. The history of Japan may be taken as a fair index of what protection may do when applied to shipping. Prior to the Chino-Japanese war in 1894 the Japanese merchant marine may be said not to have existed. What few steamers and sailing vessels it did have had to be requisitioned for military purposes with the consequent scarcity of shipping facilities for commerce. Freights naturally rose and there followed a considerable purchase of vessels by the government and private citizens alike, so that by the end of 1895 the steamer fleet of Japan had an aggregate tonnage of 331,000 tons. This expansion was beyond the normal requirement of the coastwise trade of Japan and the excess of shipping had to seek employment in the foreign field. There they met the competition of the flags of England, Germany and Norway.

What did Japan do? Taught by the experience of its war with China that if the country was to have an expanding future it must provide for the development of its merchant marine, the Japanese accordingly enacted laws for the encouragement of ship building and navigation. These laws came into operation in October, 1896, and led immediately to the establishment of services to America, to Europe, to India and to China. Moreover, lines were opened to Hankow and Ischang via Shanghai as the importance of the Yangste valley to Japanese trade became obvious. These were followed by lines via Formosa, Anoym, Swatow and Hong Kong. Signs of progress were also manifested in other directions. Prior to the enactment of the law for encouraging ship building all vessels had been purchased abroad with the single exception of one wooden vessel of 1,000 tons. But a great impetus was given to the ship building industry by the law. Japan began to build its own ships in well-established yards so that by the close of 1903 it had 675,000 tons of steamers and 320,000 tons of sailing ships, a total fleet of 977,000 tons. These figures may be small but they nevertheless exceed the tonnage of the United States in the foreign trade by 96,000 tons, the United States having only 879,000 tons engaged in that trade. At the outbreak of the Russo-Japanese war Japan found herself with a merchant fleet four times greater than it had been at the time of the outbreak of the war with China nine years previous.

Here is a concrete illustration of the advantages to be derived from the protection of shipping. The United States today is in as bad a plight as Japan was nine years ago when it was unable to enjoy the fruits of its victory over China. So small is the merchant marine of the United States that in the event of complications with any foreign country its oversea commerce would be completely stalled and as upon the perpetuity of this commerce the prosperity of this country depends, the country would find itself with every mine shut down and every mill closed. Its tonnage is now so small that the Isthmian Canal Commission has to go abroad to buy ships to carry supplies to that great work. It might be pertinent to ask why the United States government is building that great ditch at all when it will scarcely have a single ship to send through it after it is built. Is it not about time to wake up?

The semi-centennial of the Sault Ste. Marie canal will be held on August 2d and 3d. On next Sunday morning it will be fifty years since the first steamer passed through from the lower lakes into Lake Superior. This was the steamer Illinois which was

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locked up on that day and immediately thereafter the side-wheel steamer Baltimore was locked down, and thus navigation which has for countless centuries been prohibited between these great bodies of water became an assured fact. The schooner Freeman under command of Capt. J. H. Andrews was the first sailing vessel to reach Lake Superior from the lower lakes. She passed through the canal shortly after the Baltimore was locked through. Before the canal was built there was scarcely half a dozen vessels on Lake Superior and all of them, with the exception of the old steamer Napoleon, had been portaged over from the lower lakes. So numerous have the ships become since and so enormous has the commerce grown that it is difficult to believe the growth to be a matter of only fifty years. The vessel interests of the great lakes certainly should take great interest in the forthcoming celebration because they are the ones directly profited by the construction of the canal, though the benefits derived from it have indirectly affected every industry in the United States. The credit of the recognition of this event belongs to the Hon. Peter White through whose personal efforts the bill to make the celebration national was passed by congress. It was he who also induced the state of Michigan to take part officially in the celebration.

Representative Grosvenor, chairman of the committee on merchant marine of the house of representatives and also a member of the Merchant Marine Commission which made a tour of the country last summer to inquire into the state of shipping in the foreign trade, has sent out a notice to all the members of the house of representatives calling attention to the importance of this legislation. It is clear that the committee intends that the bill should be placed upon the calendar for early consideration. Mr. Grosvenor has been diligent also in directing the attention of various newspapers and public men to this proposed legislation. He says very flatly in these letters that unless something is done by the next congress the hope of American shipping interests may as well be abandoned. Continuing he adds: "If with all the present information we have, congress and the president will continue to ignore the just measures which have been introduced and advocated by the friends of the American merchant marine, we may as well abandon all future attempts and make the best terms we can with foreign shipping. Two hundred million dollars a year for freight to go to foreigners is not an unimportant factor, but the greater factor is the circumstance that foreign ships are searching the countries of the world for markets for foreign manufactures."

Mr. Grosvenor very pertinently concludes that the cost to the government to carry out the propositions involved in the bill submitted by the commission will be very trifling in comparison with the scope and operation of the law. It will not cost as much for ten years as will be spent during the same period upon some one of the great harbors of the country.

FREIGHT SITUATION

Since the break in coal rates chartering in that trade has been quite active and several million tons have been covered upon the basis of 30 cents to the head of the lakes and 40 cents to Milwaukee. Coal is moving freely and the effect of this has been felt in the ore trade. There are not as many vessels seeking cargoes at upper lake ports though there is sufficient tonnage to care for the business that is offering. However, shippers are not having ore vessels thrust upon them as was the case a little while ago and the tone of the market is consequently firmer. Dispatch is excellent both at the head of the lakes and at Lake Erie ports and a great volume of ore is moving. However, it is clear that a terrific pace will have to be kept up if shipments are to reach 30,000,000 tons as was predicted at the beginning of the season. In order to reach this figure considerable more than 4,000,000 tons will have to be moved monthly, the highest monthly average ever attained on the great lakes.

Vessels have been diverted from the grain trade to the coal trade with the result that the grain rate is stiffening. It went from 1 to 1¼ cents and some owners are now demanding 1⅜ cents.

HOW ORE WAS FORMERLY UNLOADED

When Capt. James Stone brought down 337 tons of ore on the schooner Queen City in 1856, the superintendent of St. Mary's canal was of the opinion that he had gotten about all that there was of it. It was at that time the largest cargo carried on the lakes. It was shipped by the Jackson Iron Co. of Marquette and consigned to the Jackson Iron Co. at Erie, Pa. It took four days to load her. It was loaded by the crew wheeling barrows up a gang plank leading from the dock. The ore was carried both on the deck and in the hold. In order to get the ore out of the hold it was necessary, when the Queen City reached Erie, to build staging in her hold about half way up from the bottom. The ore was then shoveled upon this staging; then from the staging to the deck and then from the deck to the dock, making three handlings in all to get the ore out of the vessel. It took four days to unload the 337 tons. It was clear that this method was mighty tedious and expensive. The next method was to unload it by means of block, tackle and a horse. A block carrying a Manila rope was fastened to the ship's rigging and a tub attached to the rope was lowered into the hold. Another block through which the rope ran was fastened on the dock and a horse hitched to this. The tub was filled by hand shoveling and hoisted by the horse walking forward. To get the tub back into the hold it was necessary for the horse to back up. Planks laid upon wooden horses both on the dock and on the deck of the vessel furnished a roadway upon which the men could wheel the barrows of ore off the vessel, two men standing about the temporary staging on deck to empty the tub of ore into the barrow. This method of unloading continued until a little deck engine was installed to take the place of the horse but the wheel barrow and plank remained as before. This system continued in vogue until 1887 when Alexander E. Brown invented his hoisting and conveying apparatus.

By the giving way of a bulkhead on the steamer Wahcondah at Ft. William a seaman named Cliff was buried beneath 6,000 bushels of grain and smothered to death.

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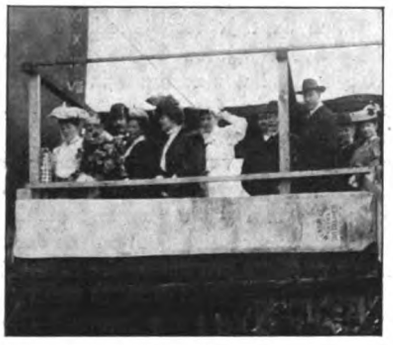
LAUNCH OF PACKAGE FREIGHTER SUPERIOR

MISS ZOA GRACE.

The steamer Superior, a model package freighter, was launched with fitting ceremonies at the plant of the Great Lakes Engineering Works, at Ecorse, last Saturday afternoon. The rain came down in torrents all morning, the clouds were lowering for a long time during the afternoon, but held off for the big event at the shipyards. Eight hundred guests of the Great Lakes Engineering Works and the Western Transit Co., left Detroit on the steamer Pleasure and after witnessing the launch, which was eminently successful, returned the same way. There were two hosts for the occasion, President A. C. Pessano, representing the builders, and Percy E. Bourke, the owners of the new ship. The Superior, as she started down the ways was christened by Miss Zoa Grace of Superior, Minn., the city for which the boat was named. Striking the water of the slip evenly and causing a tremendous splash which in a way rivaled the rebound of the contents of the champagne bottle which landed in Percy E. Bourke's overcoat after having performed its duty on the bow of the Superior.

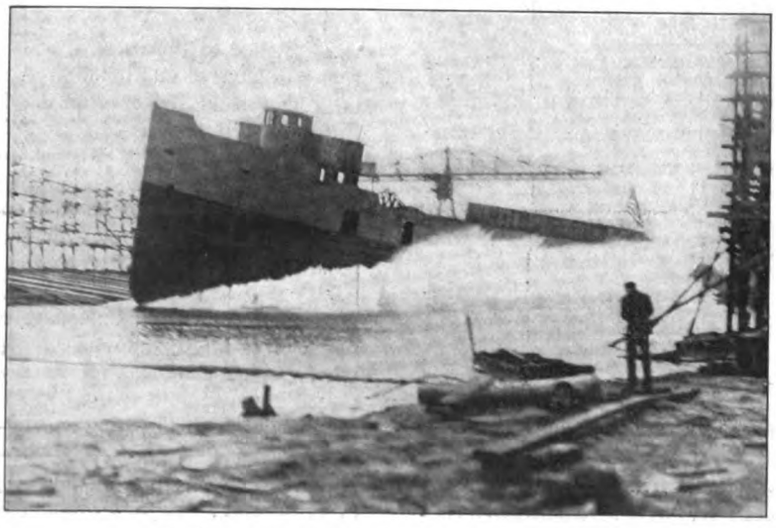


THE LAUNCHING PARTY.

The launching party consisted of Miss Zoa Grace, Mr. and Mrs. H. H. Grace, Miss Winifred Bardon, Benjamin Finch, J. H. Culver, Mrs. B. S. Loney, Miss Frances Loney, and Mr. and Mrs. J. H. Roth, all of Superior; P. J. Curry, Buffalo, general superintendent for the transit company, Hugh Wilson, Buffalo, superintendent of machinery; Robert Humble, Buffalo, superintendent of steamers; Percy E. Bourke, Detroit, agent for the Western Transit Co.; A. C. Pessano, John R. Russel, William E. Quinby, Judge Hosmer, and Henry Penton.

The Superior, which is a sistership to the Buffalo, of the same line, will be ready to go into commission during the latter part of July. She measures 401 ft. over all, 381 ft. keel, 50 ft. beam and 30 ft. deep, and will be sailed by Capt. Donald Gillies, who has been with the line for thirty-five years. Henry Hess, chief engineer, has been in the fleet for forty-one years. The launching party from Superior came from the head of the lakes on the steamer Buffalo and returned on the same boat Sunday afternoon. The Commercial Club of Superior through Mr. Grace, in recognition of the honor of having the new ship named for their city presented a handsome clock to the boat.

CAPT. DONALD GILLIES WHO WILL COMMAND HER.



JUST AS THE SUPERIOR WENT OVERBOARD.

WISNER APPOINTED.

Mr. George Y. Wisner has been appointed a member of the International Waterways Commission to succeed Prof. Gardner S. Williams of Ithaca, N. Y., resigned. The other American members of this commission are Col. Oswald H. Ernst, government engineer and Mr. George Clinton of Buffalo. This commission is to act jointly with a similar commission of three members

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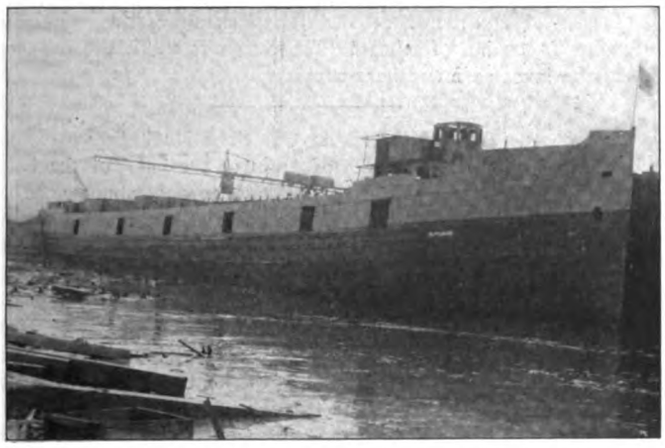
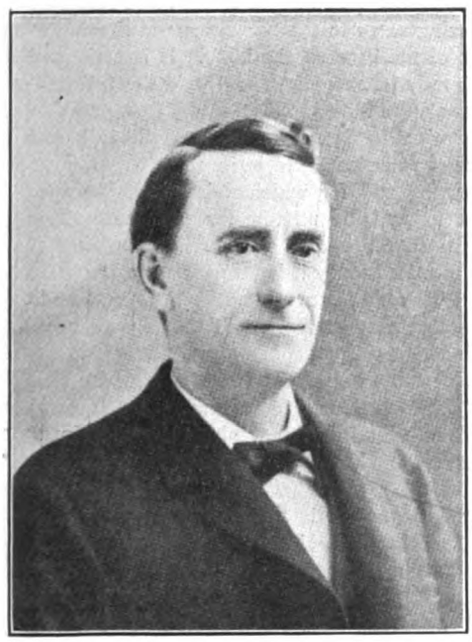
appointed by the Dominion government to investigate the general subject of lake levels. A particular object of its inquiry will be the level of Lake Erie and the construction of a



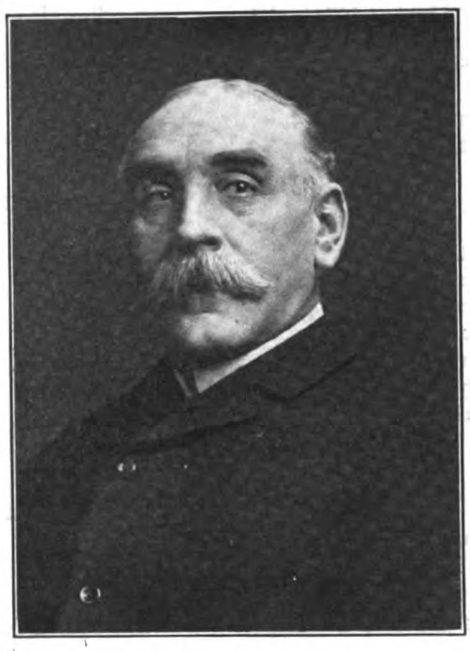
THE SUPERIOR IN THE WATER.

dam at the outlet of Lake Erie has been suggested to increase the level of the lake. Mr. Wisner is especially well qualified to serve upon this commission as he has had long experience in engineering matters dealing with waterways. He was a member of the Deep Waterways Commission of several years ago.

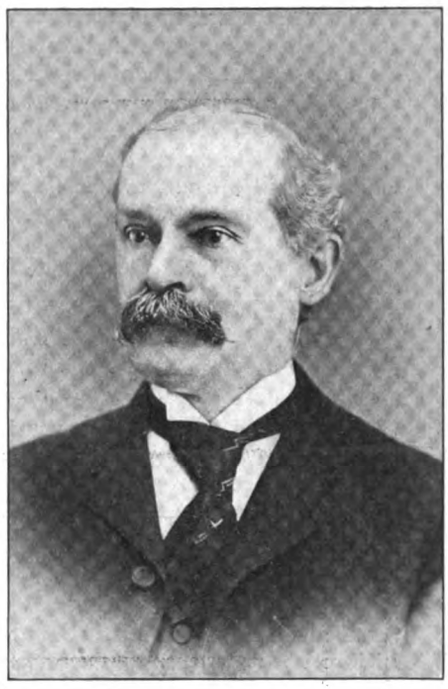
INTERNATIONAL WATERWAYS COMMISSION.



MR. GEORGE CLINTON.



COL. OSWALD S. ERNST.



MR. GEORGE Y. WISNER.

CANADIAN SHIPPING NOTES

The purchase of the ship building yards and engine works of the Bertram Engine Co., Toronto, by the Canadian Ship Building Co., has been definitely arranged and possession is to be taken immediately. The Canadian Ship Building Co., has a yard at Bridgeburg, Ont., on Lake Erie, where vessels will be built entirely for the upper lake trade, and the Bertram yards will be utilized for the building of vessels of canal size, and excursion type steamers for the Lake Ontario and St. Lawrence river trade. The first vessel which the new owners will build at the Toronto yard will be the new express steamer for the Niagara Navigation Co. The combined yards will be under the management of A. Angstrom, formerly with the Bertram Co., but latterly with the Canadian Ship Building Co.

The Quebec Steam Whaling Co. has purchased the steamer Falke in Norway, for whaling purposes in the Gulf of St. Lawrence. The Falke was expected to reach Quebec June 15.

At a public meeting held in Quebec recently, a resolution was passed favoring the establishment of a direct line of ocean steamers from Quebec to Great Britain, and a committee has been formed to see what can be done in the way of arranging with some steamship owners for such a service.

Merchants and business men of Quebec have petitioned the Dominion government to abolish the tax of 5 cents per register ton on shipping at that port.

A test has been made in Hamilton, Ont., bay, of a vessel propelled by water, pumped through a brass tube running along the full length of the hull. On the trial a 45 ft. boat was used, and a 37 H. P. gasoline engine was used to pump the water into the tube in which there is a number of valves. It is claimed that the compression of the water in being forced through the tube makes the vessel move. The inventor is J. Dudley, and the friends who are finding the money propose forming the Hydraulic Navigation Co.

Companies have been formed at Horton, N. S., with the title of the Brig Curaco Co., and the Brig G. B. Lockhart Co., respectively, to take over the brig Curaco, and the brig G. B. Lockhart. The first named company has a capital of $10,000 and the second a capital of $7,500. The directorate in each case is the same, viz: J. T. and D. E. North, of Horton, N. S.; G. B., W. and F. Lockhart of New York.

The friction between the Canadian Pacific Ry. officers and the port authorities at St. John, N. B., respecting wharf accommodation have resulted in reports that the railway is about to develop an independent port of its own at Stockton Springs, Me. Plans have been prepared by an engineer for new wharves at St. John, showing an additional 150 ft. of wharf fronts, with sheds and other equipment.

The Laird-Paton Co. (Ltd.) has been incorporated at Montreal, with a capital of $95,000 to take over the general contracting business heretofore carried on by Laird-Paton & Son, and boat and canoe building business carried on by the St. Lawrence Canoe & Boat Co. The provisional directors are: Jas. and H. L. S. Paton, W. J. Thompson, J. Sutherland and G. A. Robertson of Montreal.

The Transportation Commission has recently held several

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meetings at Winnipeg, Man., when the questions of the navigation of the Red River, where the Dominion government is constructing a lock and canal, and of the governing of navigation to Hudson Bay were discussed. The chairman, R. Reford, of Montreal, expressed grave doubts as to the practicability of the latter route.

The Turbine Steamship Co. is considering the possibility of placing an order for another steamer. The president and two of the directors are in Newcastle-on-Tyne in consultation with the builders of the Turbinia in regard to plans.

The steam yacht Ellen of Rockport, Ont., has been sold by F. Huck to Capt. Reid of Cardinal, Ont.

The ferry steamer, the hull of which was built by the Bertrams of Toronto, being completed at St. John, N. B., is expected to be launched on the 17th inst. She will be named Ludlow. Fleming Bros., St. John, constructed the engines, and put the hull together on the arrival of the parts from Toronto.

A company is being organized at Midland, Ont., for the purpose of constructing a dry dock at that port. J. Playfair of Midland is one of the principal promoters of the project.

The Canada Iron Furnace Co.'s tug D. L. White, has been renamed the Midland, at the port of Midland, Ont.

Capt. C. P. Marshall of the Canadian Pacific Ry. steamer Empress of India, has retired after 14 years' service. He has been appointed one of the Elder Brethren of Trinity House, the corporation which looks after the lighthouses of the coast of Great Britain.

The French steamer Pro Patria, running between St. Pierre, Miquelon, and Nova Scotia ports, which went ashore at Forchee at the end of May, has been abandoned as a total loss, and will be sold by the underwriters.

Andrew A. Allen of the firm of H. and A. Allen, Montreal, has been elected representative of the Shipping Federation of Canada, on the Montreal Harbor Board.

The city of Toronto has been authorized to expend $45,000 for a freight shed on the city wharf, and $15,000 on other buildings on its Yonge-Bay street wharf.

The Dominion parliament has voted $30,000 for the further prosecution of hydrographic surveys in the St. Lawrence and on the Pacific coast.

ANOTHER NEW COAL DOCK

Duluth, June 13.—The second of three new coal docks planned for the head of the lakes has been announced, and is to be built this year. It had been thought that this project might not be undertaken till the coming year. It is now probable that the third project will lie over for this season. This second is the dock of the Northern Coal Dock Co., which is a successor to Jones & Adams, who sold out their former company, name, good will and all, to the Pittsburg Coal Co. a few months ago. The new dock is on land bought by them some time previous to the sale to the Pittsburg company, and adjoins the site on which M. A. Hanna & Co. are now building a large dock.

A local Duluth paper is printing news items of 20 years ago in contrast to the corresponding news of today. A few days ago it had these two pieces of news for June, 1885:

"* * * The Onoko, in which Duluth vesselmen have long felt great interest, as she is the largest vessel on the great lakes, is on her way here from Chicago light for a cargo of wheat. She has been chartered through J. T. Rose at 2½ cents and will carry out of here about 85,000 bushels of wheat. Freights have never before been so low. The United Empire cleared on Tuesday with 10,600 barrels of flour for Sarnia. She will carry the flag this year also for a flour carrier. George King is her new clerk. The Empire has a fine orchestra as an attraction this season."

Jas. T. Rose, who placed this record cargo on the Onoko, is still in the vessel business at Duluth, looking not a day older than he did twenty years ago, but cargoes of 85,000 bu. are not taken now. The United Empire is still afloat, under the name of Saronic, and its then purser, Geo. King, is now a successful contractor at Duluth. Ten thousand barrels of flour, 85,000 bu. of wheat! These figures mark the progress of the lakes as few others could.

AT THE HEAD OF THE LAKES

Duluth, June 14.—Stocks of grain at the head of the lakes are fast disappearing and amount now to only about 7,900,000 bu., including everything. Of this but 1,300,000 bu. are wheat; the great bulk of the rest is flax, and there is no probability that this will be moved out for some time. Shipments last week amounted to 1,200,000 bu. and receipts were but 90,000 bu. The wheat rate to Buffalo is now 1¼ cents. The Minneapolis chamber of commerce on Wednesday of this week votes on the proposition to change the contract grade of wheat to 2 northern, as Duluth did two weeks ago. There has been a sharp fight over the proposition and it was uncertain at the time of writing how it would go, but the indications seemed to point to the change.

The Lake Superior & Southeastern road, which is said by officers of the Wisconsin Central to be another name for that company, is buying large tracts of land at Duluth and Superior with the view of making entry to the two cities and sharing in the railway business of the head of the lakes. It is estimated that the road has already taken options and paid the full purchase money down for more than $250,000 of city lots, and that it has options amounting to $400,000 more on which it has made small advance payments. This is in addition to large dock sites it is acquiring and for which it is paying advance money. The road just now is negotiating for options on about 300 acres of dock frontage property on the Superior side of the upper bay, but the most money it has so far spent has been for Duluth realty. This road is surveying for a direct line to Chicago, and it is stated that its track will be fully 30 miles shorter than that of the most direct competitor. While it is announced by the Wisconsin Central that it is behind the new road there are many who are inclined to think there is some other road still further behind, and that ultimately the Grand Trunk will loom up as the real power in the matter. The Wisconsin Central is not a road that would be apt, judging from the general opinion as to its financial ability, to build a line from Chicago to the head of Lake Superior, especially as it now has a road from there to Ashland, 80 miles east on the lake. There is no logical reason for a Wisconsin Central line to Duluth, and the Grand Trunk is known to be heading this way. So far this new road, whatever it is, has not condemned a single piece of property in either Duluth or Superior, but has come into the open market and taken options direct from the owners for all that it has wanted, paying down 2 percent when the options were given and is now paying the remainder of the full purchase price.

Aside from the completion of the G. W. Perkins and considerable repair work there is nothing doing at the Superior yards of the American Shipbuilding Co. But the officials of the yard hope for a ship or two to build the coming winter, as other berths of the company are fast filling up.

Lumber shipments from the head of Lake Superior are slightly quiet now, for the winter sawn and last fall dry lumber has all been moved away and little of the spring sawn is yet in condition to ship. A number of lumber boats have been put into the ore trade temporarily in consequence. In the course of a month or so lumber shipments will be very heavy.

Geo. Wieland, of Duluth, has been awarded the contract for extensive repairs and improvements on the government pier at Ashland. For some time this pier has been falling to pieces. The work calls for 35,000 tons of rock.

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CHICAGO GRAIN REPORT

Chicago, June 13.—Total shipments of the last week, as will be noted from figures below, is considerably in excess of the previous period. Rates were advanced to basis 1¼ cent Buffalo corn with active chartering and shiping call looking to maintain strong tone for the near future. All water routing to Montreal is in fairly active demand at 3¾c to 4 cent corn. Lake and rail steamers are filling out in grain to some extent, but package freight conditions are reported to be in very fair position.

Comparison of the 1904 harvest in wheat and oats with estimate for 1905 as compiled by United States government department of agriculture, favors the present crop period; the wheat estimate running closely to record crop of 1901. The figures suggested follow:

	1905. Gov't. est.	1904. Gov't. Harvest Report.
Wheat	713,334,000	552,400,000
Oats	899,900,000	894,600,000

Lake and rail shipments:

	This week.	Last week.	Same week last year.
Wheat	164,873	223,821	508,642
Corn	2,348,103	1,796,375	1,777,262
Oats	922,639	833,426	911,706
Rye	9,162	20,237	12,200
Barley	33,000	26,363	23,462
	3,477,867	2,900,222	3,233,272

Shipments since Jan. 1, 1905:

		Same time last year.
Wheat	5,923,000	6,061,050
Corn	36,206,665	24,597,738
Oats	21,803,863	21,739,350
Rye	570,318	751,118
Barley	2,216,780	2,544,135
	66,900,626	55,693,391

Stocks of grain in private and public elevators:

	This week.	Last week.	Same week last year
Wheat	1,669,000	2,393,000	3,063,000
Corn	3,477,000	4,594,000	6,340,000
Oats	3,434,000	2,984,000	1,408,000
Rye	122,000	136,000	453,000
Barley	22,714	22,714	134,000
	9,024,714	10,129,714	11,398,000

NAVIGATION OF CORNWALL CANAL

The Dominion government has made a rule respecting the navigation of the Cornwall canal which is quite obnoxious to vessel interests. The rule reads:

"Every vessel shall be brought to a dead stop 100 ft. from the nearest gates of the lock. The winch cable must there be secured to some suitable post on the vessel by the vessel's crew, after which the vessel will be drawn into the lock by the winch. Before the vessel moves under the impulse of the winch, all the usual and necessary lines for controlling the vessel must be out, and must be handled by the crew in such a way as will prevent too great speed being developed, and must be held at such a point as to effectually stop the vessel as soon as she is fully within the lock. While the vessel is being locked her crew must change the position of the winch cable in such a way as will allow the winch to pull the vessel out of the lock. When locking is completed, the vessel's crew must release the winch cable from the vessel."

The Railway and Shipping World says of this: A deputation consisting of J. A. Cuttle, president, Montreal; A. A. Wright, Toronto; C. A. Jacques, Montreal, and F. King, secretary, representing the Dominion Marine Association, interviewed the minister of railways and canals, May 17, and protested against the enforcement of the rules. A petition setting forth in detail the objections of the association to the various rules was subsequently sent to the department.

The petition sets forth that the regulations, while of no practical advantage in any way, will cause vexatious delay, and largely increase danger in the passage of the canals, and will thus prove extremely prejudicial to the best interests of the canal. The objections as given in detail, set forth that if carried out, a vessel would be out of control 100 ft. away from the lock about to be entered, would be hampered in entering the lock, and liable to damage the gates or herself; and would be expelled from the lock in an improper direction, and in a manner endangering her safety. The petition concludes: Captains and pilots of experience in every case report delays of at least 2½ or 3 hours over and above the time occupied before these regulations were enforced, and unite in condemning the regulations as unsafe, unsatisfactory, and, in a wind, quite impracticable. The whole process would appear to be cumbersome and laborious, entailing much extra labor from the crews of vessels without apparent advantage, and causing as well the most vexatious delays in navigation.

EXAMINATIONS FOR ASSISTANT ENGINEERS

Examinations will be held commencing July 5 to fill three existing vacancies for second assistant engineers in the United States revenue cutter service and to provide a list of eligibles from which to make appointments. Applications must be filed with the secretary of the treasury department, Washington, D. C., before June 25. While the appointments will be made upon the recommendation of the board of engineer officers of the revenue cutter service, the examinations will be held in a number of cities in order to make it unnecessary for the applicants to travel. The list if cities will be supplied by the secretary of the treasury. The examinations are technical and of such scope as to require that the competitors have an education equivalent to that obtained at the leading technological institutions. It is not necessary that applicants for appointment be graduates of technical schools. There is a provision in the rules wherein it is stated that the applicant must have "not less than six months' experience in charge of, or assisting in the care and management of, the steam machinery on a seagoing vessel in actual service." It has been found that a strict observance of this requirement has prevented many young men who are otherwise competent from making application to take the examination. To overcome this difficulty an applicant who has passed the examination and is otherwise eligible is permitted to serve on a cruising vessel a probationary term of six months. During this term he receives the same treatment as a commissioned officer with $75 per month pay.

OHIO CENTRAL DOCKS AT TOLEDO IMPROVED

The Ohio Central Docks at Toledo have been extensively improved this spring and made easily accessible for vessels by reason of dredging in front of the coal and ore machines so that there is now 20 ft. of water at normal stage, from the face of the dock out to the government channel. The dock has also been faced with 12 in. sheet piling along the front and thus placed in first class condition. Vessels will experience no trouble in getting in and out from this dock as was the case last year.

OBITUARY

Capt. Gustavus Ryder died at his home at Chelsea, Mass. last week. He was born at Chatham, Oct. 20, 1837. He was a member of one of the old sea-faring families of Cape Cod and for many years was a capable master mariner. Lately he had been engaged in the ship chandlery business in Boston.

Andrew Jackson Frisbie died at his home in Salem last week. He had been engaged in ship building at Salem since 1872 and built many fishing vessels and yachts.

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ITEMS OF GENERAL INTEREST

H. C. Milnor, Knoxville, Tenn., is building a boat to operate on the Tennessee river.

Plans are now being completed for the new revenue cutter for Pamlico Sound and bids will be advertised for shortly.

The first-class battleship Africa of 16,350 tons was launched at the Chatham dock yard last week for the British admiralty.

The members of the International Waterways Commission met in Washington last week to hold a preliminary conference.

Capt. W. H. Goodhall of San Francisco has purchased the steam launch Lucro from the receivers of the Pacific Packing & Navigation Co.

The Matthews Boat Co., Bascom, O., has received an order to construct a steam launch for the king of Portugal. The boat is to be 30 ft. long.

The new revenue cutter for use on Pamlico Sound for which plans are now being drawn is to be provided with Babcock & Wilcox water tube boilers.

The John P. Holland Submarine Boat Co. has filed articles of incorporation at Newark, N. J. The authorized capital of the new company will be $1,000,000.

A revision in colors of the chart of Duluth and Superior harbors has just been issued by the United States lake survey and is for sale by the Marine Review.

The Panama Canal Commission has advertised for a tug boat which it needs for service in the Colon Harbor. Bids will be opened at Washington, June 30.

Charles Rohde & Sons, Baltimore, have just launched a large scow for the S. M. Hamilton Coal Co. of Baltimore. It is 92 ft. long, 28 ft. beam and 8½ ft. deep.

Robert Palmer & Sons, Noank, Conn., have received an order from the Philadelphia & Reading Railroad Co. for six barges each to be 175 ft. long, 35 ft. beam and 14 ft. deep.

Roach's Ship Yard, Chester, Pa., has received an order for a large new freight steamer for service on Long Island Sound in one of the lines controlled by the New York, New Haven and Hartford Railroad.

The cruising boat Dreamer designed by Henry J. Gielow and built by Robert Jacob, City Island, N. Y., for Mr. C. W. Lee, of the New York Yacht Club, has been sold to Commodore Frederic T. Adams.

A twin-screw propeller is being built at Palmer's yard, Noank, Conn., for the Middlesex Transportation Co. for the New York-New Brunswick route. She will be 115 ft. long, 22 ft. 4 in. beam and 7 ft. 5 in. deep.

Charles P. Doe of San Francisco has bought the old whaler Newport and also the little steamer Maggie plying between San Francisco and Half Moon Bay. The Newport will be put in action between San Francisco and San Pedro.

The White Star liner Gaelic employed in the Pacific service under the flag of the Occidental & Oriental Steamship Co. plying between San Francisco and Yokohama has been sold. The Gaelic was built in Belfast in 1885.

The new Sound steamer Providence built by the Fore River Ship Building Co., Quincy, Mass., has been given a royal reception at the ports at which she touches. The latest was at Providence, at which all of the officials of the city attended.

The hydraulic dredge Delaware was launched from the yard of the Maryland Steel Co., Sparrow's Point, Md., last week. The Delaware is 315 ft. long, 46 ft. beam and 19 ft. 6 in. deep, and is being built for the government engineers' department.

The protected cruiser Galveston, which was built by the Wm. R. Trigg Co., Richmond, Va., and finished by the government at the Norfolk navy yard after the private firm had failed in business, underwent her trial trip recently and maintained an average speed for four hours of 16.42 knots.

It is reported that the Cunard liner Campania was in continuous wireless communication with land throughout the entire voyage from Liverpool through one of her recent trips. In mid-ocean she had simultaneous communication with America and Europe, a feature which has not hitherto been accomplished.

The hydraulic dredge Philadelphia building by the Maryland Steel Co., Sparrow's Point, Md., for the United States engineers' department was launched last Saturday. She is 300 ft. long, 52 ft. beam and 22 ft. 6 in. deep. She has four boilers each 4 ft. in diameter and 12 ft. long with a working pressure of 125 lbs.

Secretary Metcalf of the department of commerce and labor has issued an order to supervising and local inspectors of the steamboat inspection service to notify vessel masters that they must immediately inform the steamboat inspection service whenever their vessels collide with lightships, buoys or other aids to navigation.

The United States Civil Service Commission will hold an examination for the appointment of an assistant inspector of hulls in the steamboat inspection service at Philadelphia at a salary of $1,800 per annum. Applicants can be examined by mail. The necessary papers will be forwarded by the commission from Washington.

The New York, New Haven & Hartford Railroad Co. has given an order to Cramp's, Philadelphia, for two transfer tugs 110 ft. long, 26 ft. beam and 14 ft. 6 in. deep. They will have compound engines with cylinders 20 and 44 in. by 30 in. stroke, supplied with steam from a Scotch boiler 15 ft. 3 in. diameter by 11 ft. long.

Percy & Small of Bath, Me., have contracts for two schooners: One a four-master of about 700 tons, for which the keel has been laid; the other a five-master for William F. Palmer, of Boston. With these two vessels on the stocks there is employment for a good number of ship carpenters in Bath, over which there is great rejoicing.

Col. Thomas W. Symons, a member of the advisory board of consulting engineers for the enlargement of the Erie canal in an interview in Buffalo last week said that all opposition to the enlargement of the canal was now dead. The opponents kept up the warfare until the last minute but have now abandoned it. Constructive work upon the Champlain section of the canal is now under way.

The British steamer Camosum, launched in February of this year at Glasgow, Scotland, reached Vancouver, B. C., on her maiden trip in May. She was built for the Union Steamship Co. of Vancouver to run between that port and Skaguay, Alaska. She can accommodate 350 passengers and 400 tons of freight. Her tonnage is 793. On her trip she averaged 10 knots per hour.

Contract has been awarded to Roach's ship yard, Chester, Pa., by the New England Navigation Co., for a freight steamer similar to the Mohawk and Mohegan to be 290 ft. over all, 45 ft. beam and 19 ft. deep. Her engines will be triple-expansion with cylinders 24, 34 and 56 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers 13 ft. in diameter by 12 ft. long.

The steamer Wyandotte, which will be used to reinforce the annex boat service of the Long Island Railroad running from Long Island City to Wall St., New York, arrived at New York from Detroit last week. The Wyandotte made the trip from Detroit to New York, a trip of some 2,500 miles, in less than fifteen days. The Wyandotte is licensed to carry 1,000 passengers.

At a meeting of the executive committee of the Arkansas Valley Navigation Association held at Port Smith, Ark., last week plans were perfected for sending a fleet of six barges down the Arkansas and Mississippi rivers to New Orleans in June. Six barges will be built by the association and products of the Arkansas Valley will be forwarded. This is considered by the association as the best means of interesting congress in the work of improving the Arkansas river for navigation.

Galveston's great sea wall is rapidly nearing completion. The structure is 17 ft. high, 16 ft. wide at the base and 5 ft.

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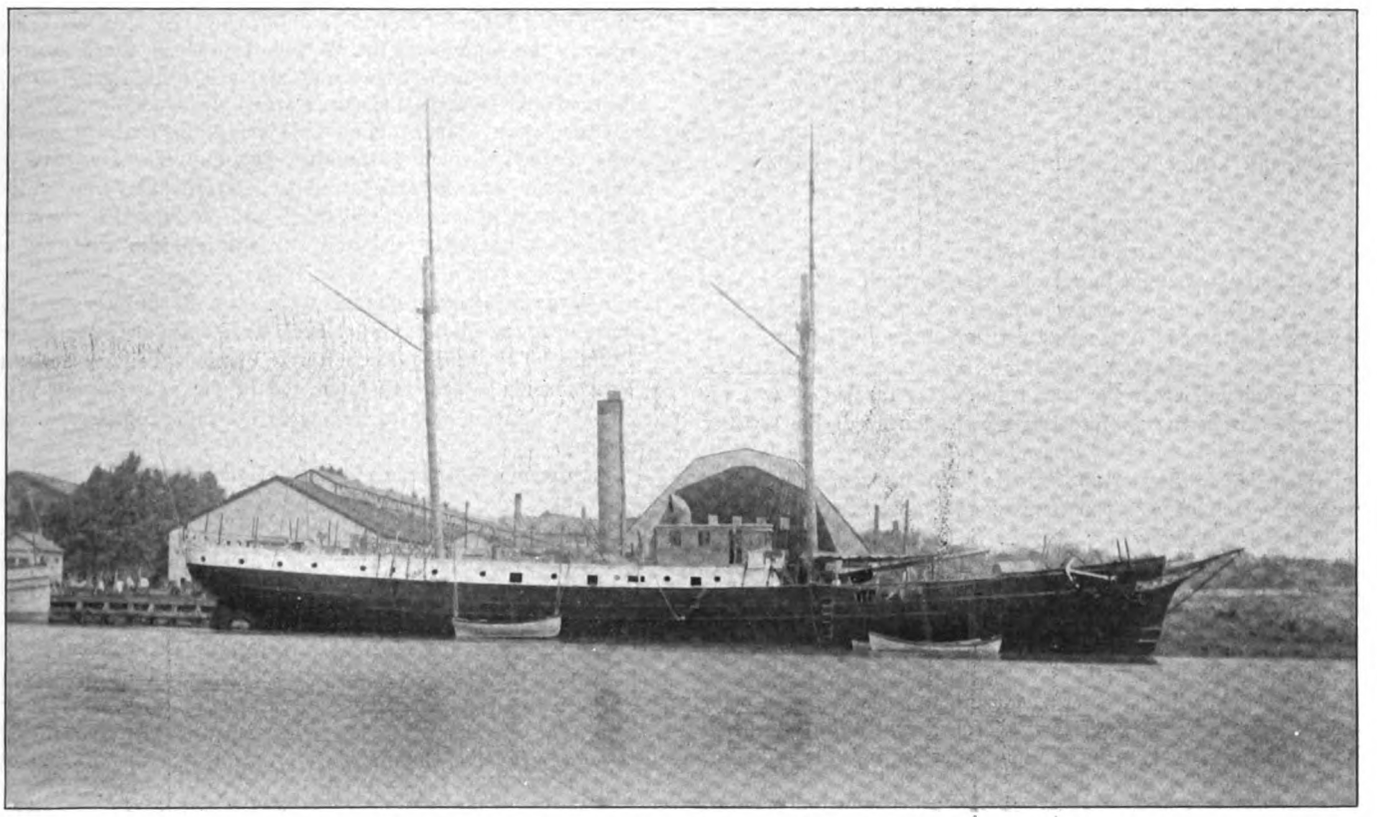
wide at the top. The foundation wall rests upon four rows of round piling, 12 in. in diameter and driven 4 ft. apart and 44 ft. down into the clay. There is also a row of sheath piling just inside the outside row of round piling driven into the ground 26 ft. below low mean tide to prevent undermining. There is also an apron 27 ft. wide by 4 ft. thick extending seaward in front of the wall composed of solid granite blocks as a further protection in case of storms and undermining currents.

The maintenance of way department of the Baltimore & Ohio railroad has been reorganized and Mr. J. B. Dickson given the higher title of chief engineer in charge, with headquarters at Baltimore. The territory of the Baltimore & Ohio system has been divided into three sections for the work of this department and three new positions of engineer of maintenance of way created. Formerly Mr. Dickson was engineer of maintenance of way on the Baltimore & Ohio system. Mr. H. E. Hare has been appointed engineer of maintenance of way of the main line system with headquarters at Baltimore; Mr. H. H. Temple, engineer of the Pittsburg system, with headquarters at Pittsburg; and Mr. J. A. Spielmann, engineer of the Wheeling system, with headquarters at Wheeling, W. Va.

The steam pleasure fleet of San Francisco is to receive an addition. John Twigg & Son, the San Francisco boat builders, are constructing for A. B. Spreckels a steam yacht to be called Lurline, which will be ready to launch in June. She will be 70 ft. long, with a beam of 12½ ft. Being intended for cruising in the upper bay, her depth will be only 6 ft. The motive power will be furnished by a Seabury engine of 150 H. P. and having a water tube boiler. A searchlight of 100 candle power will be operated by an independent engine. The craft is copper fastened and has four watertight bulk-heads. The pilothouse and cabin will be entirely of mahogany. There will be an owner's cabin, several berths and accommodations for a crew of four. She will be steered from a bridge. The deck will be enclosed with a network of rope and covered by an awning.

The American Locomotive Co. has consummated arrangements for the manufacture on this side, of the Berliet automobile—one of the best known French cars. Although one or two foreign designed cars are built in part here, this will be the first instance of an American concern making a foreign car with American material and by American labor, complete in every detail. The American Locomotive people will immediately begin the construction of a specially equipped plant for the manufacture of the Berliet machines, and the cars will be in the market early next season. The announcement is one of the most interesting made for some time past in the automobile industry. The American Locomotive Co. is one of the largest builders of machinery in the world and includes in its organization some of the foremost mechanical and engineering talent which will be available for its new enterprise. It is the intention, furthermore, of the company to make the automobile an important adjunct to its present manufacutring business. A new plant will be built adjoining the Rhode Island Locomotive works.



THE TRAINING SHIP FERN WHICH IS TO BE STATIONED AT DULUTH FOR USE OF NAVAL RESERVE.

An appropriation of $758,000 has been made for rebuilding bridges and culverts along the Erie Railroad, as a part of the comprehensive scheme now under way for the complete rehabilitation of the road. This does not include the sum of $500,000 to be used for the improvements at the Fifty-first street yards in Chicago, nor the lesser expenditures on the Niles & Lisbon, Newcastle, New York, Susquehanna & Western, and Bath & Hammondsport Divisions of the Erie. The largest single expenditure is one of $150,000, for the bridge over the tracks at the Chicago yard, a structure 66 ft. long and 435 ft. wide, designed to do away with grade crossings at that point. On the Susquehanna division the expenditures will aggregate $266,000, where forty-five bridges and culverts are being rebuilt. This work includes the complete rebuilding of the bridge over the Chenango river. When this 814 ft. structure is completed, every one of the old style latticed bridges on the division will be done away with, a change made necessary by the increased weight of the locomotives and trains.

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AROUND THE GREAT LAKES

The steamer Arundel is in the Detroit dry dock for final repairs before leaving for the Thousand Island run.

The new steamer Philip Stackhouse, building at Wyandotte will be launched the latter part of July.

The Dominion government has decided to abolish the position of collectors of the canals. As no tolls are now collected the compilation of statistics has been discontinued.

The steamer E. H. Gary struck an obstruction in going into Conneaut this week and knocked all the buckets off her wheel.

The steamer Turbinia while in the dry dock at Kingston, Ont. had a new center propeller and had some other alterations made.

The tug Grayling, owned by Carkin, Stickney & Cram of Detroit is being put in shape at Oade's ship yard, Detroit, for a trip to Mobile, having been sold to Mobile parties.

Whitney Bros., of Superior, have secured the contract for the harbor improvement work at Port Wing, Wis., during the coming summer.

The new lighthouse on the outer end of the west breakwater at Ashtabula harbor has been placed in commission and the beacon on the end of the west pier has been discontinued. The range light on shore will be continued.

The new lighthouse at the outer end of the west breakwater at Ashtabula was put in commission this week and the beacon on the end of the west pier which has served for many years was discontinued. The range light on shore will be continued.

The steamer Havana owned by F. P. Mills has completed repairs and will enter the coal trade. Her machinery was replaced during the winter with the machinery of the steamer Sparta.

The Toledo Steamship Co. has been incorporated with a capital stock of $225,000 to manage the steamer which the Craigs are building for Mr. L. S. Sullivan and others of Toledo.

The Andrews scraper is now installed on four docks at Cleveland, one at Milwaukee, one at Conneaut, one at Ashtabula and one at Buffalo in addition to the one at the Detroit Furnace dock.

The Anchor line steamer Delaware, to be built at the plant of the Great Lakes Engineering Works, will go on the berth vacated by the launch of the Superior for the Western Transit Co.

The business heretofore carried on in Toronto by the firm The Polson Iron Works, has been acquired by the Polson Iron Works, Ltd. The new company has acquired all the assets of the business and has obtained its liabilities.

The executive committee of the Lake Carriers' association will meet in Washington on July 1 and will ask the special commission appointed by President Roosevelt for some modifications of the present rules governing freight carriers.

The steamer W. G. Mather, building at Ecorse, and to be the beamiest boat on the lakes is now well along on the berth from which the steamer Hoover & Mason was launched. The Hoover & Mason is now nearly completed.

The Northern Coal Co., at Duluth, has decided to expend $350,000 in a new dock west of the Hanna dock on Connors point and have it in operation at the opening of navigation next spring.

The new tug Judge W. B. Saunders, building at the Cleveland yard of the American Ship Building Co., for the Kelley Island Lime & Transportation Co., will be ready to go into commission within a short time.

The Northern Steamship Co., operating the North West and North Land, will this season inaugurate a new American plan service supplementary to the European plan service which has been in vogue since the big white boats have been operating.

The Empire Ship Building Co., of Buffalo, has secured the contract for the construction of the hull of a new wooden fireboat for Chicago. The engines, boilers and pumps of the fireboat Yosemite, now laid up at South Chicago will go in the new boat.

The new steamer E. H. Gary of the Pittsburg Steamship Co., made her first trip to Lake Erie ports last Tuesday. She arrived at Conneaut early in the morning, unloaded a little over 9,700 tons and cleared late the same afternoon. No effort was made to establish an unloading record.

Remarkable time is being made by the Detroit Ship Building Co. in completing the big new steamer Lyman C. Smith which was launched at the Wyandotte yard Saturday, May 27. Her machinery is all aboard and her dock trial has been had. She will be delivered within 20 days of the date of her launching.

The little steamer Belle, of Green Bay, has been secured to operate between Detroit and Grosse Ile. No boat has been on the route since the Wyandotte took up the excursion business out of Buffalo and was later sold to the Long Island railroad and went to the coast.

The Detroit Ship Building Co., is making a record on the new steamer Lyman C. Smith. The hull was launched at Wyandotte May 27 and towed to Detroit. On June 2 the boilers were in position and filled, and on June 8 the engine was given its dock trial and she will go into commission June 17.

A large ore storage plant is to be built for railway convenience near the Minnesota ore dock on Ganson street in South Buffalo. The Buffalo, Rochester & Pittsburg railway and the Pennsylvania system are interested in the new storage yard and the plans show it to be one of the most complete in the country.

The steamer Chaquamegon of Ashland now running between Milwaukee and White Fish Bay, will shortly leave for the southern coast of California. Her owner, Louis Cartier, has invited a few guests to accompany him. The steamer is 101 ft. long, and 22 ft. beam and was built at Manitowoc in 1893 for service between Ashland and the Apostle Islands.

The St. Lawrence Floating & Wrecking Co. will endeavor to recover the valuable cargo of the Dominion liner Scotsman, wrecked on East Point, Gulf of St. Lawrence, several years ago. The Scotsman, as part of her cargo had $200,000 worth of copper for the Dominion government, and this was to be minted into coin.

Capt. Harris W. Baker, of Detroit, has succeeded in raising the hull of the old steamer Greyhound, from the bottom of the river where it has been resting for several months. The hull has been used as a dump scow for Detroit alley refuse. The schooner Hubbard which was imprisoned in a slip by the sunken hull was released and cleared for Point Pelee for a cargo of gravel.

Prof. H. C. Sadler of the University of Michigan, within the next two weeks will start for Europe where he will investigate and study the experimental model testing tanks that have been established there. The experimental tank at Ann Arbor is now nearly completed and the model cutting machinery is about ready. Prof. Sadler will return to Ann Arbor Sept. 1.

The Gilchrist steamer Yakima, after being aground on the head of Stag Island, St. Clair river, since Saturday morning, caught fire and was completely destroyed last Tuesday morning. She was down-bound with a cargo of ore, and carried $40,000 insurance. She was built at Cleveland by Capt. Thos. Wilson in 1887. The crew had a narrow escape as all members were asleep at the time the fire was discovered, 3 a. m.

The steamer Bessemer of the Pittsburg Steamship Co.'s fleet had a narrow escape from being sunk on Lake Superior this week. She was bound for the head of the lakes light

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and collided on Tuesday morning with the steamer Sylvania of the Tomlinson fleet. The Sylvania hit the Bessemer on the port side first and struck her again amidships. The Bessemer had a hole in her side 80 ft. long. The accident occurred in a dense fog off Whitefish Point.

The United States lake survey steamer General Williams reports the following locations of the wrecks of the steamers J. E. Mills and Specular: The former lies about 4½ miles N. W., true, from the north end of Middle Sister island, on the course between Detroit river and Green Island lights. From the wreck Detroit river light bears N. 29° 45′ W. and Colchester reef light N. 74° 10′ E., both true. Two spars show above water. At present stage of water there is 32 ft. around and 13 ft. over the wreck. The wreck of the Specular lies about 3⅛ miles S 50° .04′ E., true, from Middle ground light. From the wreck Pelee island light bears N. 82° 54′ W., and old Dummy light foundation N. 23° .03′ E., both true. There is 36 ft. around and 19 ft. of water over wreck at present stage. The wreck was marked temporarily by black and white flags nailed to a small spar buoy.

A much needed harbor of refuge is to be constructed at some suitable position on Keweenaw point by the United States government in the near future for the purpose of making a safe sheltering place from the great storms around that peninsula. The exact location has not yet been settled upon and extensive information will be sought for the purpose of hitting upon a suitable location. The most northerly situated point is Copper harbor, which is a sand-locked bay 3 miles long and about a quarter mile wide. The water is deep and offers ample refuge to any number of boats from the wind and waves. Lac La Belle is also spoken of as a suitable harbor. It is on the east side of the point and is 2 miles long and a half a mile wide. While Copper harbor has a depth of 18 ft. at the entrance, Lac La Belle would need considerable dredging before it can be used by the larger ships. The harbor will be chosen from the opinion of the majority interested in its construction, and to this end a letter was sent to the steamboat interests and residents of the northern peninsula of Michigan by Maj. Charles L. Potter, United States engineer at Duluth, for the purpose of ascertaining information as to the construction of a harbor near Keweenaw point.

RIVER NEWS

A preliminary meeting of those interested in improved inland waterways has beeen called for June 29 and 30 at the Grand Hotel in Cincinnati. President John L. Vance of the Ohio Valley Improvement Association is sending invitations to all interested in this movement throughout the country and there is every indication that the meeting will be largely attended. The meeting will be held for the purpose of formulating plans for holding a national inland waterways convention some time later in the year and it is probable that a permanent organization will be the outgrowth. The national waterways convention which was held in Baltimore in 1901 was followed by the passage of a rivers and harbors bill by congress carrying an appropriation of $60,000,000. The convention to be held in the fall of the year will not only urge congress to make this appropriation at the coming session but a similar appropriation every year, until some of the gigantic projects under way are carried out.

The American Bridge Co., New York, now has received orders for twenty steel barges for use on the Ohio and Mississippi rivers. Several have already been delivered and the work on the remaining is well under way at Ambridge, Pa., on the Ohio river. The steel barges not only have a greater carrying capacity than the ordinary wooden craft in general use but it is believed that they will have a much longer life. Ordinary wooden coal boats now sent down the river from Pittsburg with coal to lower Mississippi river points are generally broken up there as the increased cost of returning them empty is greater than the cost of replacing them, when the revenue secured from their timber is considered. Orders for steel barges have been received from the Pittsburg Coal Co., Pittsburg; Union Sand Co., St. Louis; Wiggins Ferry Co., St. Louis; and the American Steel & Wire Co., Chicago.

A meeting of the board of United States engineeers appointed recently for the purpose of examining into the practicability of canalizing the Ohio to a depth of six or nine feet and the approximate cost of the same, was held in Cincinnati last week. The proceedings of the conference are kept secret and will not be made public until they are submitted to the war department. In the near future the members of the board will make a trip from Pittsburg to Cairo for the purpose of more closely studying conditions. The board consists of Lieut. Col. D. W. Lockwood, Lieut. Col. C. B. Sears, Col. Ruffner, Major W. L. Sibert and Major H. Zinn.

Major W. L. Sibert, United States engineer, Pittsburg, has received authority from the war department to enter into a contract with the Dravo Contracting Co., Pittsburg, for the construction of Lock No. 3, Monongahela river at a cost of $260,000. The dam will be built by the government. The lock will be completed the end of this year, but the dam cannot be constructed until late next year. Work on Lock No. 2 is proceeding favorably, the lock gates now being placed. This lock will be completed entirely this year.

The steamer W. W O'Neil, one of the largest towboats owned by the Monongahela River Consolidated Coal & Coke Co., Pittsburg was sunk in the Ohio river at Louisville, last week. The steamer had just returned from New Orleans with a fleet of empty barges and was sunk by striking a snag. The cost of raising her will be about $10,000.

About 5,000,000 bushels of coal was sent south on the Ohio river from Pittsburg on last week's rise. The Monongahela Consolidated Coal & Coke Co. sent out ten tows and C. Jutte & Co. sent out three. The Pittsburg harbor is again filling up with loaded coal boats in anticipation of another June rise.

PERSONAL

Wm. Watts of Detroit will be chief engineer on the steamer Pilgrim of the Oscoda & Cleveland Transportation Co.'s fleet.

R. Reford has resigned his position as member of the Montreal Harbor Commission and it is reported that he will be succeeded by A. A. Allan.

Capt. Burke of the Midland Queen was presented with a hat and a purse of gold in recognition of his having taken the first steamer into port for 1904-5.

Capt. George H. Kearney, who has been at the head of the steam engineering branch at the Charleston navy yard for the past five years has been transferred to the New York navy yard. Capt. William Sturtevant Moore succeeds him.

The business conducted under the co-partnership of Sadler, Perkins & Field, Maritime building, New York, has now been incorporated under the laws of the state of New York, the name remaining the same.

Capt. John H. Wyson has qualified as master of the tug W. B. Sanders which is building at the Cleveland yard of the American Ship Building Co. for the Kelley Island Lime & Transport Co.

Lieut. W. E. V. Jacobs has been relieved of the command of the revenue cutter Tuscarora and will shortly be succeeded by Lieut. L. F. A. Lewis, formerly attached to the cutter Algonquin.

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THE RACE FOR THE KAISER'S CUP

The schooner yacht Atlantic which won the Kaiser's cup for the quickest cruising across the Atlantic ocean is 188 ft. over all, 137 ft. on the load water line, 29 ft. beam and 16 ft. 6 in. draught. She was designed by Wm. Gardner of New York for Mr. Wilson Marshall, Bridgeport, Conn., and was built by the Townsend-Downey Ship Building Co., Shooters Island, N. Y. She was designed for ocean sailing and offshore cruising and is a complete sailing yacht in every respect. She has a centerboard and deep keel. Her masts are 22 in. in diameter and her rigging is stronger than that generally used on most yachts of the same size. The Atlantic has also the complete propelling machinery of a steam yacht and has made 11 knots under steam. The propelling machinery consists of a triple-expansion engine of about 300 H. P., two Almy water-tube boilers with a Bevis feathering propeller wheel which fills complete her aperture when feathered for sailing. The sails are raised by steam. The yacht is lighted by electricity and has one large dynamo and engine and a large set of storage batteries. The yacht also has a large complete acetylene plant, a two ton refrigerating machine and porcelain lined ice boxes with a capacity of 800 cu. ft. When under sail no one would ever suspect the Atlantic of being an auxiliary as her stack is housed, her rig is lofty and her sheer and general profile are those of a powerful schooner yacht. Following are the distances made each day by the Atlantic in her recent trip: 116, 222, 229, 270, 223, 243, 341, 282, 268, 239, 313, 282, a total of 3,028 miles.

More than usual interest centers in the ship rig British built yacht Valhalla and it was conceded by everyone that if she could get heavy weather with the wind anywhere abaft her beam she would give a very good account of herself. As it is she was the third to arrive in 14 days 2 hours and 53 minutes, being beaten about two days by the Atlantic and one day by the Hamburg. Had the Valhalla carried the wind to the finish she would have beaten the Hamburg and would have pressed the Atlantic hard. As it was, she sailed a longer course than the Atlantic by about 200 miles. Comparing the logs of the two boats, the Atlantic took the lead at once and on the 21st had sailed 976 miles and the Valhalla 779: on the 22nd, however, the Atlantic made only 113 miles while the Valhalla sailed 284 miles and at noon on that day the Valhalla was just 26 miles astern of the Atlantic; on the 23rd the Atlantic beat the Valhalla by three miles in distance sailed and on the 24th when the Atlantic made her record breaking run of 341 miles, the Valhalla made 287 miles. On the 25th the Valhalla made 210 miles to the Atlantic's 282. The next the Valhalla made 278 miles and the Atlantic 243, so that by noon on that day the Atlantic had sailed just 9 miles further than the Valhalla. The Valhalla was practically becalmed on the 30th, making only 156 miles and on the next day she could make only 78 miles and at noon that day was 41 miles from the finish. The Valhalla was built in England in 1892 and is 239 ft. 6 in. over all, 37 ft. 2 in. beam with a draught of 20 ft. 6 in. She is the largest auxiliary yacht in the world. Following is a table showing how the yachts finished and their elapsed time at the Lizard.

Yacht.	Finished. Day.	H. M.	Elapsed time. D H. M.
Atlantic	May 29	9 16 P. M.	12 04 01
Hamburg	May 30	7 22 P. M.	13 02 06
Valhalla	May 31	8 08 P. M.	14 02 53
Endymion	May 31	9 34 P. M.	14 04 19
Hildegarde	May 31	10 08 P. M.	14 04 53
Sunbeam	May 31	11 40 P. M.	14 06 25
Fleur de Lys	June 1	2 48 A. M.	14 09 33
Ailsa	June 1	4 25 A. M.	14 11 10
Utowana	June 1	5 06 A. M.	14 11 51
Thistle	June 1	12 44 P. M.	14 19 29
Apache	June 5	10 20 A. M.	18 17 20

INTERNATIONAL MARITIME COMMITTEE

The International Maritime Committee is holding its seventh meeting at Liverpool this week under the presidency of Mr. Justice Kennedy. It was formed in Belgium in 1897 under the title of the Comite Maritime International. The central body has its office in Antwerp under the presidency of M. Beernaert, Minister of State and ex-President of the Chamber of Deputies, with M. Louis Franck, avocat, as secretary. The object of the committee is the unification of maritime law by the removal of those divergences between the various national systems which cause most practical inconvenience or hardship. To achieve this end legislation is of course necessary; and, as legislation cannot be obtained without the support of public opinion in the country whose law is to be changed, national associations were formed at the outset in all the chief maritime countries. Their duty is to ascertain and, where necessary, conciliate and guide public opinion, and, when the time is ripe, to promote legislation by the proper channels. These national associations vary in size up to as many as 500 and draw their members from the ranks of ship owners, underwriters, average adjusters and merchants, as well as lawyers; in fact, lawyers are in point of number usually in the minority.

In Great Britain the place of a national association is taken by a "Maritime Law Committee" of the international association, presided over by Lord Alverstone, Chief Justice of England, with Dr. Stubbs as secretary. Each country has one representative upon the permanent board of the International Committee, Mr. McArthur, M. P., average adjuster, being the British member. The Chief Justice, Mr. Justice Phillimore, Mr. Carver, K. C., Mr. Elmslie, average adjuster, Sir John Glover, chairman of Lloyd's, Sir John Gray Hill, ex-president of the Law Society and secretary of the Liverpool Steamship Owners' Protective Association, Colonel Sir Henry Hozier, secretary of Lloyd's, Sir Alfred Jones, K. C. M. G., ship owner, Mr. T. R. Miller, of the United Kingdom Mutual Steamship Assurance association, Mr. Stanley Mitcalfe, secretary of the North of England Steamship Owners' association, Mr. Douglas Owen, ex-chairman of the association of average adjusters, and Dr. Stubbs, barrister, are the British members of the Comite.

At the first meeting, which took place at Antwerp, collisions at sea and salvage were chosen for discussion on account of the divergences of law which characterized them, because they were simpler than some other questions and because, having been discussed at the meetings of other bodies in previous years, some progress had been made in clearing the ground towards general agreement. The committee, after discussion, formulated a series of questions on which the opinion of the national association was asked as to all the chief points of these two branches of law; and copies of the questions were sent to each national association for its consideration and report. During the year the national association ascertained the views of their governments, of the leading commercial bodies and of the lawyers of their countries, and after discussion drew up their reports stating in answer to the questions what, in their opinion, the various rules of the law of collision and salvage, respectively, ought to be. At the next conference, held at Brussels in 1898, these reports formed the basis of discussion. According to the present constitution of the commission each national association can send six delegates to the conference, and each country has one vote, an absolute majority of votes sufficing to pass a resolution. This method of voting is open to criticism. It might be urged that voting power should be proportional to national tonnage; but due weight is in fact attached to the position and views of the greater maritime countries, and in particular of Great Britain as the greatest of them; and the method has been found to work well in practice. The above system of procedure has been uniformly adopted since 1897. The pro-

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posals of the national associations were discussed at Brussels in 1898; and, finally, after conferences at London in 1899, and at Paris in 1900, at each of which further reports of the national associations were considered by the committee, draft international codes of law on collision and salvage were almost unanmiously agreed on at the Hamburg conference of 1902. At all these conferences Great Britain was strongly represented, and voted in favor of the proposals embodied in the codes. Thus, to obtain after six years of public discussion practical unanimity between the representatives of thirteen nations whose laws on some points, at any rate as to collision, differed widely, was a remarkable achievement, in itself evidence of the public utility of the committee's labors. It is also matter of congratulation that upon most points the codes are in conformity with Anglo-American law; and upon those points where English rules have not been adopted long Continental practice and strong practical advantages sufficiently warrant the adoption of the rules to be found in the codes.

As soon as these two draft codes had been agreed on the Belgian government, at the instance of the committee, approached the powers with a view to calling together a diplomatic conference for the consideration of the draft codes, and, if approved, for their adoption by legislative measures in the countries interested. In this mission Belgium was supported by the co-operation of France and the United States. This diplomatic conference was accordingly convened and met in Brussels in February last. The United States, Japan, France and most Continental nations were represented. Great Britain and Germany sent no representatives. The conference—subject to certain amendments—approved the draft codes in the form of draft treaties, and adjourned till September in order that the plenipotentiaries and delegates might communicate with their respective governments. It is matter of regret to the committee that the governments of Great Britain and Germany did not see their way to take part. However, his Majesty's government, in answer to a question from Mr. McArthur in the House of Commons, promised to give the draft treaties their careful consideration; and perhaps there may still be room for hope that they may decide to be represented in September.

The chief points concerning collision and salvage in the two draft codes may be noted. In cases where both ships are in fault, the court is not to be bound by the hard and fast English rule of dividing the total damages equally, but if one ship is more to blame than the other may make it pay a larger proportion of the damages. On the other hand, whereas some Continental countries by their present law limit the damages recoverable to the cost of repairs, the code adopts the English principle of complete indemnity, compensation being made for loss of profit and other consequential loss. The English defense of compulsory pilotage is abolished, the master remaining responsible for his ship, with the pilot as his adviser. The rule of some Continental countries that, unless a protest is made by the captain within 24 hours of reaching port, and proceedings commenced within one month, no action shall lie for collision is abolished; but a limitation of two years is imposed. In salvage English law has been adopted, with little variation; success remains the criterion of the right to reward.

In addition to collisions and salvage, the committee have discussed jurisdiction in collision cases, limitation of ship owners' liability and conflicts of law as to mortgages and privileged liens; and upon the two first subjects draft codes have been agreed on. The question of limitation of liability is one of great importance. At Paris and Amsterdam it was agreed that the ship owner liable should be permitted to limit his liability either by abandoning the ship or her value, which is the Continental and American rule, or by invoking the present English limitation of £8 or some other rate per ton of the ship's tonnage. This question will be the chief subject of consideration at Liverpool; and after it will be discussed (2) conflicts of laws as to mortgages and liens, and (3) conflicts of laws as to freight.

SUBMARINE SIGNALS ON THE KAISER

A system of submarine signaling has been installed on the North German Lloyd liner Kaiser Wilhelm der Grosse which has received the commendation of the ship's officers. Second officer Rabien of the Kaiser in speaking of the same said:

"Every ship's hull," said Mr. Rabien, "is practically a drum. Sound vibrations in the water travel at four times the speed they do in the air and can be heard for miles whether they be caused by the action of the screws of a steamer or the ringing of a bell. For instance, without any special apparatus at all sailors working on the floor of a schooner can detect the sound made by the screws of a liner miles away. Now, the problem of which the apparatus on this ship is the outcome has been to collect these sound waves as they strike the ship's hull and then convey them to the officer of the bridge.

"To do this a small tank—smaller than a man's hat—is attached to the inner side of the skin of the liner. This tank is filled with a chemical solution, denser than water, which contains the microphone. There are two of these tanks on the Kaiser Wilhelm der Grosse, both forward, and to each of them is attached a wire which leads directly to the bridge above. At the end of each wire is an ordinary telephone receiver, which, when the liner nears shore and the weather is foggy, the officer on duty keeps constantly to his ears. There is a switch provided by which you can shut off either the starboard or port microphone, and the officer holding the instrument is enabled to hear bells struck beneath the water several miles distant.

"The noises made by the engines of the liner when she is traveling at great speed do not seriously affect the working of the instruments, while when she is in a fog and naturally traveling at a reduced speed this obstacle is practically obviated, the result being that the officer holding the receiver can judge almost exactly the distance he is from the warning bells. He can also tell exactly the direction from which the sounds come, two advantages that submarine signaling has over wireless telegraphy.

"There is no doubt that in the development and application of this system lies the solution of the problem of navigation in the densest of fogs. By means of a numerical code not only can warning, but information as well, be conveyed with great accuracy. For instance, on the voyage that ended at New York on Tuesday (May 30) I was on the bridge when the Kaiser cleared German waters and again was there as she neared the American mainland. When four miles distant from the mouth of the river Weser I plainly made out the signals conveyed from the lightship there.

"As we neared Nantucket I had the receivers to my ears, and when we were about four miles distant from the lightship off that place I caught the signal sixty-six—six bells, a pause and then six more bells—the Nantucket lightship code signal. When we were about the same distance from the Fire island light I caught the signal sixty-eight, the code number of that place, and again as we approached Sandy Hook the Sandy Hook code number, fifty-one, rang just as clearly and plainly.

"By the use of this system of submarine bells the whole coast between New York and Boston sends out warnings for miles, and there seems no excuse why the same conditions should not obtain along the coasts of all nations. Another use these bells can be put to, in my mind, is in naval warfare, especially with reference to the approach of submarine torpedo craft. It would be the easiest thing in the world to keep track of their movements, and the danger of their landing a telling blow would be reduced to a minimum. Great Britain, Germany and Italy have taken up the system, which

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they are installing along their coasts, while in Canada the St. Lawrence is guarded with the bells from the Atlantic to Quebec."

REDUCTION IN SUEZ CANAL DUES

Liverpool, June 5.—Confirmation is forthcoming in the full report of the Suez Canal Co. of the anticipation given in my last letter as to the extent of the reduction in dues which the board feels constrained to make as a consequence of the buoyant revenue of the company. The receipts from shipping on the canal show an increase of about 12,500,000 f. The same circumstances that had produced the augmentation of the traffic in 1903 contributed to the results obtained in 1904. They were characterized on the one hand by an exceptionally intense activity in the exportation of agricultural produce from India, especially of wheat, and furthermore by a marked enlargement in the shipment of coal to the far East. The directors say that the simultaneous effects of these two factors do not permit them to consider as absolutely normal the increase realized in 1904. They were bound to take that view into account in fixing the amount of the dividend at 141 f. net, and in constituting with the surplus of receipts above the expenses a special reserve of 5,000,000 f. The fixing of the dividend for 1904 besides implied a particularly important question. That dividend necessarily reached the amount at which the application of the rules they had adopted would require them to consent to a further reduction of the passage dues. If they had proposed the distribution of the whole of the profits realized in 1904, the consequence would have been a double reduction of 50 cents per ton. The partly exceptional character of the results obtained during the last year would not have justified so great a reduction. It had appeared to the board on the contrary that in increasing the dividend above the sum of 135 f. which would have corresponded to a simple reduction of 50 c., they could not limit the reduction in the dues to that sum. What they desired was to avoid reductions in the tonnage dues of small amount that would constitute a loss to the company without the necessary compensation of a stimulus to the development of the traffic. The surplus represented by a net dividend of 141 f. assures exactly a reduction of 75 c., which will apply from Jan. 1 next. By creating the extraordinary reserve fund of 5,000,000 f. with the remainder of the profits for 1904, the directors provide against the consequences in 1906 of the reduction of the tolls, even supposing the traffic should not go on increasing. A very high compliment is paid to the new British director, Mr. J. W. Hughes, one of the heads of the Harrison line of Liverpool, whose firm is said to be one of the principal customers of the canal. The directors remark that no one better qualified to represent British shipowners could have been chosen. Mr. Hughes has been elected to the seat rendered vacant by the resignation of Mr. J. B. Westray.

One thing which British builders apparently cannot do is to construct a yacht which will beat a craft of the American design. Again has a boat flying the "stars and stripes" lifted the prize for quick sailing, and this time there is not the plea of "home waters" in her favor, for the race was across the Atlantic. The three-masted schooner Atlantic beat all the boats opposed to her, and made a splendid run across the ocean at an average speed of 10½ knots. Of one thing Britishers can at least be proud—she was sailed by a British master, Capt. Barr, who is recognized as the premier yachtsman on either side of the Atlantic. Capt. Barr declined to discuss the race, but the owner, Mr. Wilson Marshall, is full of praise of his skipper's handling of the yacht, for whose victory Capt. Barr's remarkable seamanship is largely responsible. The actual time occupied on the journey from Sandy Hook to Bishop's Rock was 11 days, 16 hours, 21 minutes, and the best sailing for a single day was 341 miles which constitutes a record. Fairly heavy weather was experienced during a portion of the voyage, as a westerly gale was blowing for two or three days. But the Atlantic behaved splendidly. After the second day from the start, the Atlantic lost sight of her rivals, and with the exception of sighting a single liner and a couple of icebergs, the journey was uneventful, consisting as the men say of eating, sleeping and working.

Dealing with casualties to vessels of 500 tons gross register and upwards, the Liverpool Underwriters' Association reports that the vessels totally lost during May numbered 18, of 39,023 tons, compared with 16 of 37,502 tons in May, 1904. These included one British sailer of 2,007 tons, and seven British steamers of 19,245 tons (compared with three steamers of 9,300 tons last May), and four foreign sailers and six foreign steamers of 5,016 and 12,755 tons respectively (compared with four sailers and nine steamers of 6,185 tons and 22,017 tons respectively). Dealing with partial losses, the returns show that during May the figures were: British, 23 sailers, and 152 steamers (against 23 and 149 in May, 1904); foreign, 26 sailers and 156 steamers (compared with 27 and 134). The causes of the losses were: Collisions, 115; strandings, 104; damage to machinery, shafts and propellers, 56; weather damage, 33; fires and explosions, 26; missing, 2; abandoned, 1, and other casualties, 38.

The Clyde, the Tyne, the Mersey and Barrow are greatly interested in the historic battle just fought between the fleets of the contending nations in the far East, for the shipbuilding centers mentioned are responsible for many of the ships of war engaged in the conflict. So far as the Russian ships are concerned, these were nearly all built at the naval dockyards at St. Petersburg, Nicolaieff, or Sebastopol—in fact the whole of Russia's war vessels are built at home with few exceptions. France, Germany and the United States have built for the Russian admiralty, but the British yards have contributed nothing. On the other hand, Japan has drawn largely from the British yards, and the choice has apparently not been without justification. Looking at the position from a business point of view there does not appear to be much in it for British shipbuilders. Russia will need to restore her navy, and her own yards cannot keep pace with the demands of the situation, but France and Germany can be relied upon and America, too, may be favored—if work is not already on order there for Russia. If Russia replaces her lost ships it will mean a matter of something like $150,000,000 for hulls and armament, that being roughly the cost of the war to that country. Admiral Togo's phenomenal success throughout in preserving his own ships, and in capturing his enemys vessels, will not necessitate the distribution of large orders, from which British builders might benefit. But the Japanese have had sufficient proof of the value of British-built warships now to continue her favors in the same direction.

Were it not for the launch of the British war cruiser Cochrane from the yard of the Fairfield company, May would have been a comparatively poor month in the records of Scottish shipbuilding. The 13,500 tons displacement which this vessel represents, however, runs up the total of 54,309 tons, a figure which is the largest for any month this year, and which has not often been exceeded by May in any previous year. Altogether 39 vessels were launched, among the number being—besides the Cochrane—a tug, two lighters, and three barges, all for the admiralty; eight cargo steamers from Port Glasgow and Greenock yards, a large number of small vessels from Ayrshire yards, and four London county council steamers at Yoker (the last of Messrs. Napier and Miller's contract for ten). It is also worth noting that no less than 11,861 tons of the output is for foreign owners, an unusually large proportion. To the total the Clyde contributed 32 vessels of 52,836 tons. The Clyde's five months total is 193,916 tons. This is only about 3,000 tons less than in the first five months of 1902, the Clyde's record year, and it has only been

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exceeded in that year and in 1899. The prospects of 1905 being equal to the district's best, are therefore, pretty fair. The contracts reported during May amount to about 25,500 tons. This total is composed mostly of small vessels, of which a considerable number have been placed recently.

"Engineering" has something to say anent the announcement I made last week that in future British war vessels are to be fitted with turbine engines. This journal says: "In all the new vessels of the navy—battleships, cruisers and torpedo craft—the intention is to fit steam turbines for propelling purposes. In all cases, the arrangement will be generally similar to that in the Amethyst when there were special high pressure and low pressure turbines for cruising purposes, in addition to the high and low pressure turbines for full speed, and to those for going astern. This enables each turbine to work at its full power at low speed, while at the middle speed the steam is passed direct into the intermediate cruising turbine, so that there is at all speeds a very considerable range of expansion with the full flow through the turbines. The Amethyst during her trials gave a high economy at full speed, while at low powers, her coal consumption per knot was not materially greater than with ordinary reciprocating engines. In commission this result has been still further established, so that from the point of view of economy there seems no reason for doubt as to the advantage of the great step the admiralty have taken.

THE LARGEST DOCK IN THE FAR EAST

In the present very critical and interesting state of affairs in the far east it is worthy of note that the largest dock in that part of the world has just been completed, and has received the biggest steamer in the Pacific waters, namely, the Minnesota. It is situated at Nagasaki, and is the property of the Mitsu Bishi Co., of which the chief partners are the members of the Iwasaki family, and who are also closely associated with the Nippon Yusen Kaisha, or Japan Steamship Co., the growth of which has been one of the most remarkable features in the making of new Japan. The dock was commenced in January, 1902. It has thus taken fully three years to construct; but this must be considered a moderate time when it is remembered that it can accommodate a steamer 714 feet long. The "Japan Daily Mail" pays a tribute to the Iwasaki family for the national services they have rendered to Japan. Quietly and unostentatiously, that family has gone on for nearly forty years adding to the empire's most valuable resources. It may be said with truth that to Iwasaki Yataro, Japan owes her mercantile marine works, which are now one of her most important assets. He it was that laid the foundations of that marine, and in a remarkably short time organized a fleet of steamers which gave the world a new conception of Japanese enterprise and capacity. The Isawaki family did not confine their attention to ship-owning, but entered extensively into other departments of industry, especially coal mining and its allied industries. The development of the coal fields of Japan has been one of the main causes of its remarkable uprising as one of the great nations of the world. Ship-owning and coal mining naturally led to ship building, and their ship building yards and dock yards are now the most complete in the far east, and are capable of turning out work of the highest quality, and for vessels of the greatest magnitude. These works have a very interesting history, beginning, as they did, in a small way in the early days of foreign intercourse. After the restoration they were managed by the Public Works Department, and very much extended. Almost twenty years ago they were sold to the Mitsu Bishi company, and Messrs. Iwasaki have taken a special pride in making them as complete as possible. With them immediate returns seemed to be a very secondary consideration, their aim being to equip an establishment of which Japan might be proud. The "Japan Daily Mail" says that "a wreath should be placed on the grave of Mr. Iwasaki Yataro when the nation celebrates its great victories in Manchuria, for had not his genius and dogged resolution equipped the country with the beginnings of a mercantile marine, that immense army now carrying the banner of the Rising Sun to such splendid successes could not have been transported oversea, or supported throughout the arduous campaign of the past thirteen months. It is in worthy succession to that remarkable man's achievements that his brother, Baron Iwasaki Yanosuke, and his son, Baron Iwasaki Hisaya, are able to augment the country's victorious rejoicing by announcing the completion of a dock where battleships can be built." Probably of more importance than all they have done is the reputation the Iwasaki family have gained for integrity and fair dealing in all their relations, and thus have done much to dispel the idea that the Japanese are specially wanting in commercial integrity, an idea which had its origin in conditions which have almost entirely disappeared.

INFLUENCE OF DEPTH OF WATER ON SPEED

A paper on this subject was read at a recent meeting of the Junior Institution of Engineers by Mr. Leslie C. Lambert. The author said that the great importance of the question of the influence of the depth of water on the speed of vessels had come into prominence during the last year, owing to the difficulty experienced by the Admiralty contractors in obtaining the required speed for the new destroyers of the River class. It was discovered that the chief difficulty lay in the fact that the depth of water in which the trials were made was not sufficient to insure the best performance. Curiously enough, experiments with Danish torpedo-boats had indicated that there might be a very shallow draught, 2 to 2½ fathoms, which gave a better result than a deeper draught, but this was abnormal. With larger craft of the modern destroyer type, an increase in depth had been proved to result in an increase ot speed, and tests on the Tyne measured mile with the same boat had shown approximately 1½ knots increased speed in 20 fathoms as compared with 8 fathoms. On the Maplin measured mile with a depth of 8 fathoms, a speed of 23 knots was obtained; on the new mile off Dover, in 16 fathoms, 25 knots; and on the Skelmorlie mile, in 40 fathoms, 26 knots, under the same conditions, and with the same H. P. Turning to the influence of the depth of water on the speed of larger craft, two instances might be given of trials of some cruisers in the British Navy. The Latona and sister ship Terpsichore, both second-class cruisers, were tried at different depths of water. The Latona was run on the mile in Stokes Bay, and the Terpsichore on the deeper Skelmorlie mile on the Firth of Clyde. The Latona at 8,700 H. P., gave a speed of approximately 19.6 knots, and the Terpsichore, at the same H. P. gave 20 knots. This represents a gain of approximately 0.4 knot due to an extra depth of water of 150 ft. The cruiser Edgar was run in Stokes Bay, requiring 13,260 H. P. to attain 20.5 knots. On a subsequent run between Plymouth and Falmouth, in deep water of an average depth of 30 fathoms, the high speed of 21 knots was obtained with 710 less H. P. This represents at the same H. P. a gain of about ¾ knot, due to increased depth of water, and it also shows that the Edgar would have attained 20.5 knots with about 1,500 H. P. less than was necessary in Stokes Bay.

Capt. L. M. Packer, an old lake captain, died at the home of his son, Wm. Packer in Cleveland last week. Capt. Packer was born at Elyria and has been sailing since he was sixteen years old. The last vessel that he commanded was the A. C. Maxwell which was owned by Henry Johnson of Cleveland.

Lachlan Currie, a well known retired marine engineer of Detroit, died at Collingwood, Ont., this week.

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TRADE NOTES

The Pilling Air Engine Co., with headquarters at Detroit, Mich., has succeeded the Pilling Air Engine Works, formerly in Bucyrus, O. Mr. J. L. Pilling is vice president and general manager.

The Marine Iron Works, Station A, Chicago, Ill., have just issued a supplement pamphlet to their catalogue No. 16. It is descriptive of their marine engines and will be sent to anyone upon request.

A supplementary catalogue has just been issued by Marine Iron Works, Station A, Chicago, that will be sent free on request. It contains illustrated descriptive matter pertaining to some of their latest steamboat work.

The Atlantic Works, Inc., Twenty-eighth street and Gray's Ferry Road, Philadelphia, recently received an order from the United States government for one of their 30 in. dimension planing machines to plane 75 ft. long. This machine is to be used at the Pensacola navy yard.

The June number of the Central Station Bulletin, published by the Nernst Lamp Co., Pittsburg, is an interesting little publication containing a great variety of matter concerning the Nernst lamp. The Nernst lamp indeed possesses many advantages which are well touched upon in the Bulletin.

The Boston & Lockport Block Co. have issued an attractive catalogue in the shape of a block advertising their products. It is really an index to their larger catalogue but gives a very good idea of the products of this company. It will be sent to anyone upon request.

The Pratt & Whitney Co., Hartford, Conn., have just issued a souvenir mailing card which is one of the most ingenious yet sent out. The card is about a sixteenth of an inch thick and is designed in such a way as to include a small illustrated catalogue descriptive of the thread milling machine manufactured by this company. It is well worth writing for.

The Erie Stamping & Manufacturing Co., Erie, Pa., are manufacturers of oil cups, grease cups, oil reservoirs and nut covers. They are also brass founders, electro platers and metal stampers. The company has issued a catalogue descriptive of its output which will be mailed anywhere upon request.

J. H. Rushton, Canton, N. Y., has just issued a catalogue concerning the Indian Girl model of canvas covered canoes built by him. They are made in four sizes, length 15, 16, 17 and 18 ft. and are very attractive. With fine lines forward and aft and a very flat floor amidship, this model combines great carrying capacity with speed. The catalogue will be sent to anyone interested.

The Glazier Nozzle & Manufacturing Co., 31 South Pennsylvania street, Indianapolis, Ind., have put upon the market the Glazier universal nozzle which is especially designed for steamboat, tug, dock and warehouse equipment without the use of hose. Connected to steam pipes or pipe lines direct, this nozzle will render more effective service than is possible with the ordinary hose now in general use. Once installed they will last indefinitely. The company will be glad to send the bulletin to anyone interested.

W. H. Blake Steam Pump Co., Hyde Park, Mass., has just put out a little catalogue devoted to the Blade horizontal air pump and jet condenser. A condenser will increase the engine output by 20 to 30 per cent and reduce by 15 to 25 per cent the steam consumed per horse power. Built as a separate unit it may be built and run independent of the main engine at any speed far more economically than the old fashioned air pump directly connected to engines. The catalogue while small is complete and will be sent to anyone upon request.

Of the eight American yachts which competed for the Kaiser's cup from the Sandy Hook to the Lizard, seven, the Atlantic, Thistle, Endymion, Fleur de Lys, Apache, Hildegart and Utowana, are fitted with Providence yacht windlasses made by the American Ship Windlass Co., Providence, R. I.

The American Ship Windlass Co., Providence, R. I., recently completed a windlass for the battleship Connecticut which is to handle four 2¾ in. cables, each cable to be attached to an anchor weighing 17,500 lbs. The whole windlass weighs 140,000 ibs. and is driven by a pair of 16½ by 14 in. engines. The windlass is capable of handling all four anchors and chains at the rate of six fathoms per minute.

A patent controlled by B. F. Sturtevant Co., of Boston, Mass., has just beeen issued for a special type of exhaust hood for grinding and polishing wheels. Its special feature consists of a receptacle to catch the particles of solid matter passing from the wheel. The suction being controlled so that it is not quite sufficient to draw them away, these particles fall to the bottom and are there collected, while the practically free air passes through a collector where the last vestige of dust is removed. The receptacle can be readily emptied when it becomes filled, and its use avoids excessive wear on the exhaust fan, piping and collector. The hood is so designed with hinges and clips that the wheel may be readily removed or adjusted to fit the wheel as it wears to a smaller diameter. The outlet is connected to the exhaust fan, and a shield, a swivel plate and an extension slide may be adjusted so as to more fully enclose the wheel and prevent the discharge of particles into the room.

The Falls Hollow Staybolt Co., Cuyahoga Falls, O., have an interesting exhibit at the Master Mechanics' Convention at Manhattan Beach, displaying hollow staybolt bars 10 ft. long, in various sizes, outside and inside diameters and samples of raw material, which is a mixture of imported Swedish and native charcoal iron. There is displayed also threaded pieces of hollow and solid bent over flat on themselves, samples nicked all around and broken to show the fibre of the finished product and samples mashed flat endwise, under a steam hammer to demonstrate that Falls Staybolt iron is not seamy.

Within the last week the Westinghouse Electric & Manufacturing Co., has received several of the largest orders which have ever been placed for motors in industrial applications, such as the driving of machine tools, cranes, hoists and paper machinery. In four orders were included five hundred and fifty-four motors of different types and capacities, aggregating a total of 12,250 H. P. The separate orders were as follows: The Morgan Engineering Co., builders of traveling cranes and hoisting machinery, with works at Alliance, O., contracted for four hundred and thirty-five motors with a total of 10,060 H. P. The order calls for seventy-five type K motors, and the remainder of the railway type for crane service. Their capacities vary from 2 H. P. to 100 H. P., and are all direct current machines. The Alliance Machine Co., also of Alliance, O., placed an order for the same type of motors, although not as large. This includes ninety-one motors whose capacity aggregate 1,500 H. P. The Wellman-Seaver-Morgan Co. of Cleveland, engineers and manufacturers, ordered thirteen direct current motors. This firm designs and builds mining machinery and hoists, and many different types of traveling cranes. For the driving of machinery in its mills the Rhinelander Paper Co., of Rhinelander, Wis., will install a number of alternating and direct current motors. Eleven of these are type C induction motors, varying from 5 to 150 H. P., and the remainder are smaller type S direct current machines. The total rated output of the installation will amount to 450 H. P.

The annual election of officers of the Maritime association of the port of New York was held last week with the following results: President, C. B. Parsons; vice president, Charles R. Norman; treasurer, G. B. Lockhart; directors, John E. Berwind, Wm. E. Cleary, W. Freeland Dalzell, J. Frank Dunham, C. D. Hoagland and Robert R. Sizer.

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VOL. XXXI. CLEVELAND, O., JUNE 15, 1905. No. 24.

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Stamford Conn.

ESTABLISHED 1830

BEGAN MAKING VESSEL RANGES 1879

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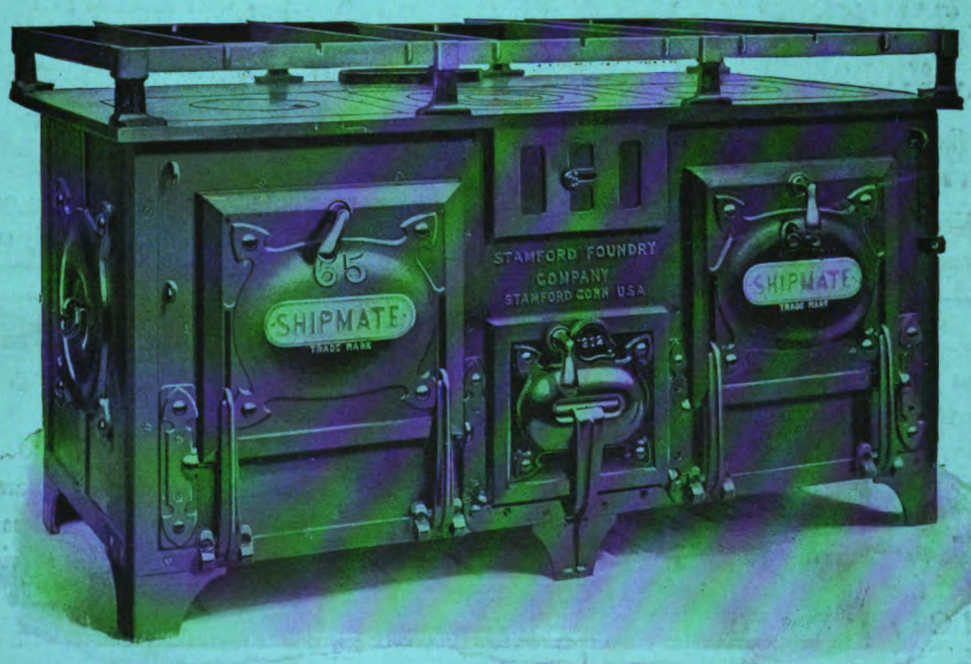

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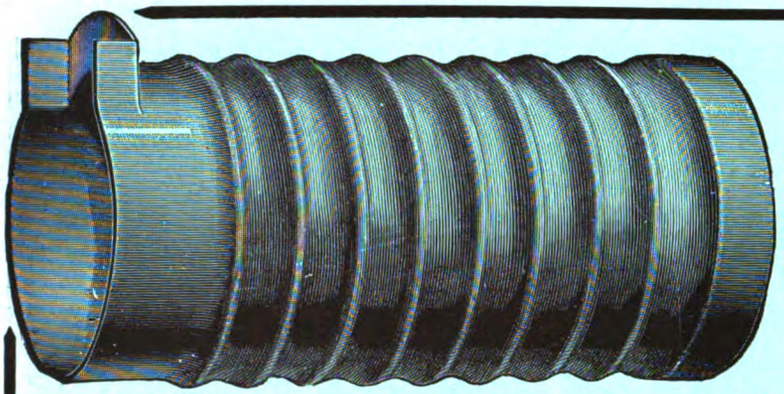

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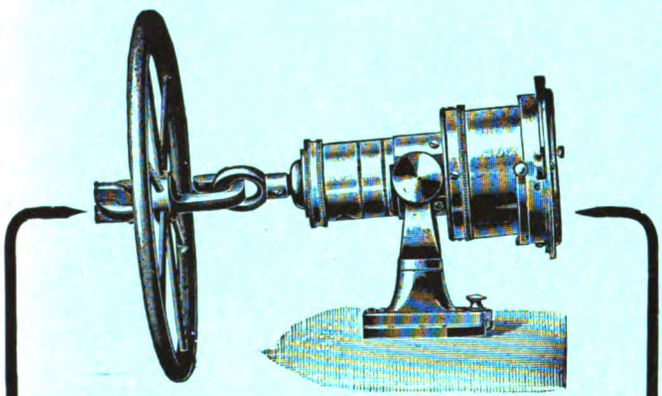

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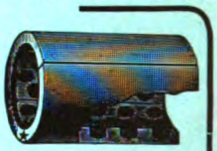

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8 sizes 11 styles

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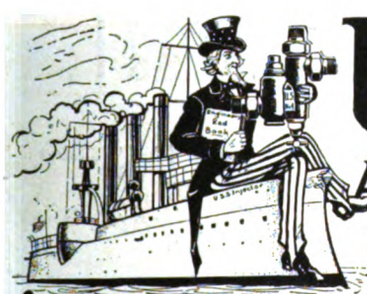

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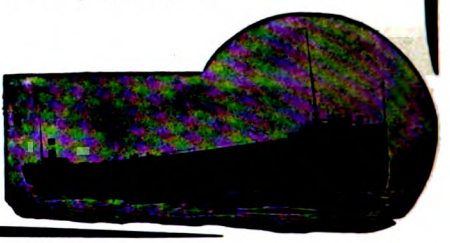

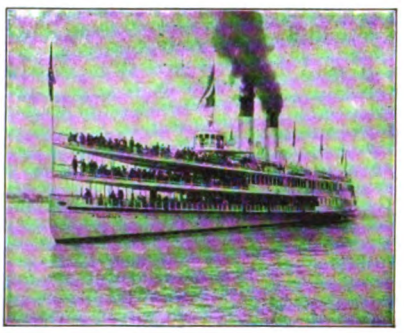

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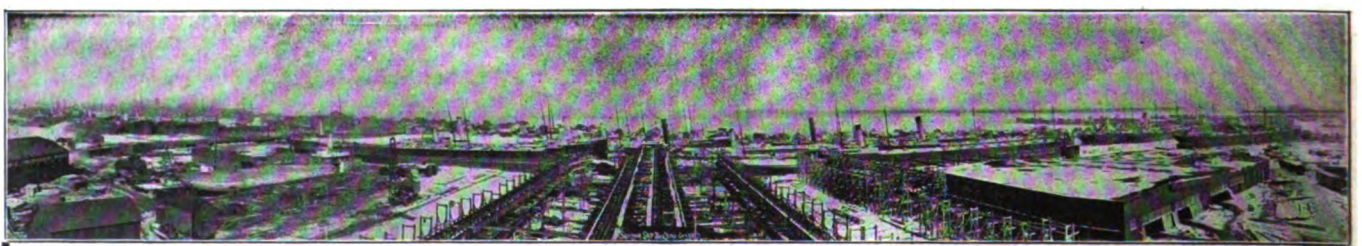

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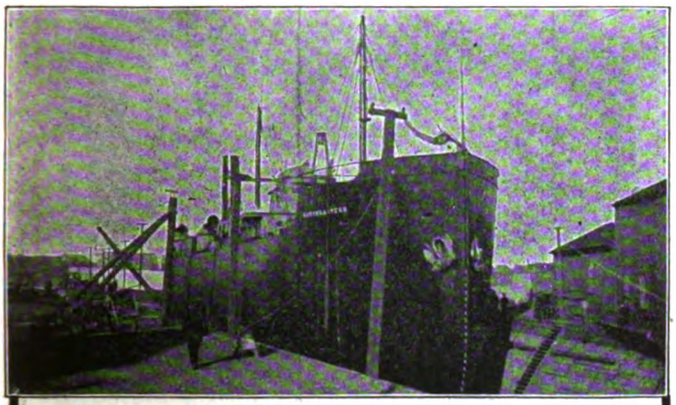

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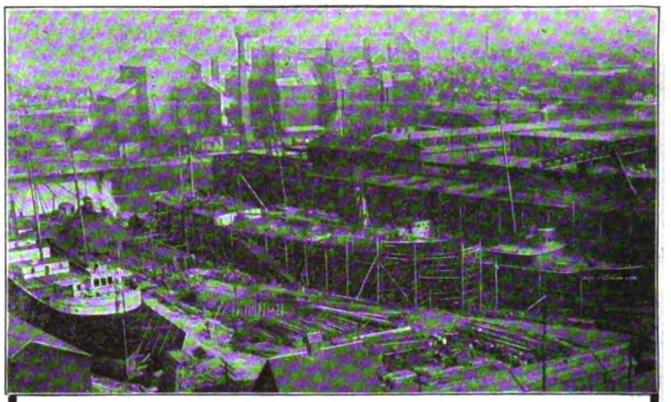

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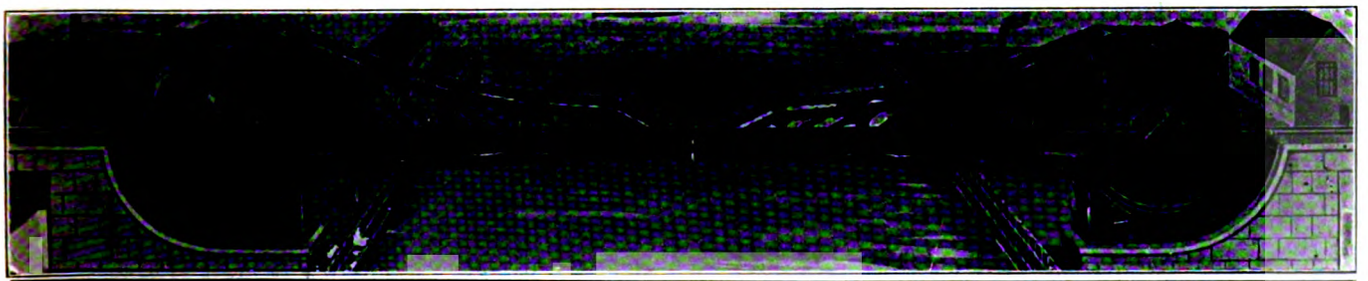

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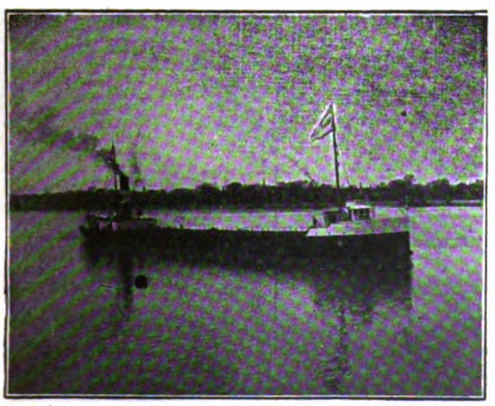

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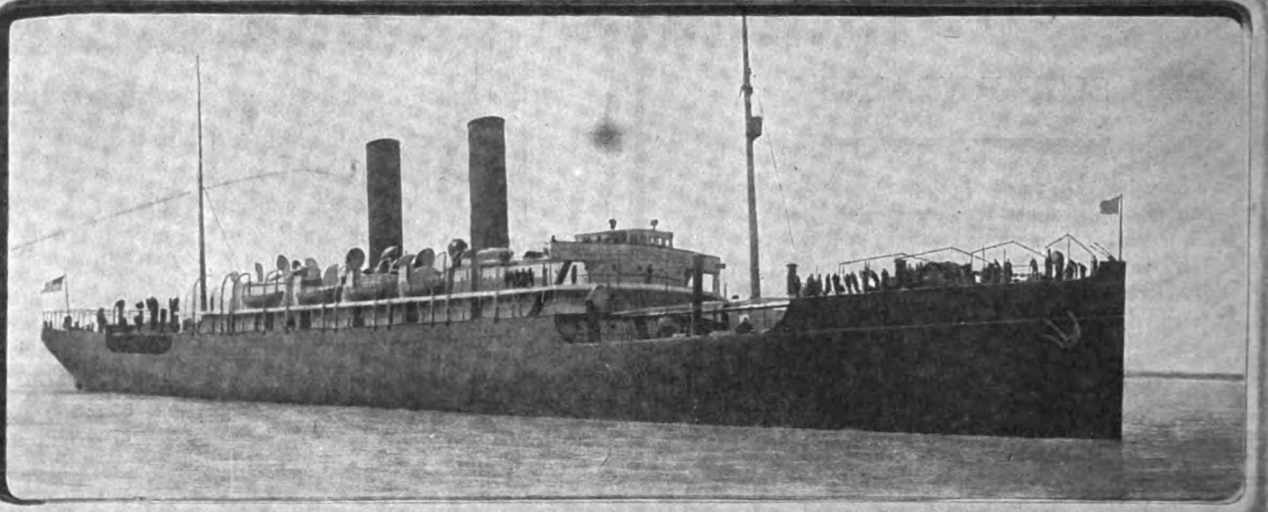

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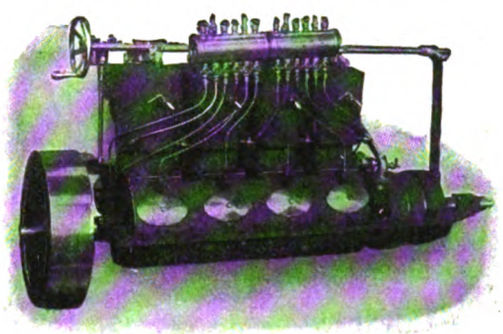

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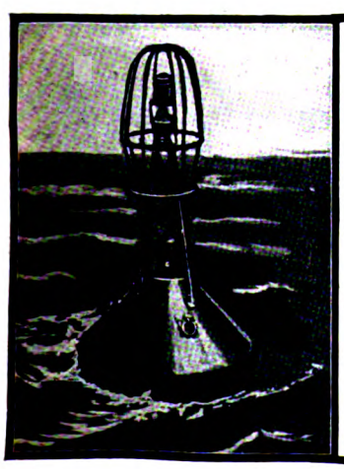

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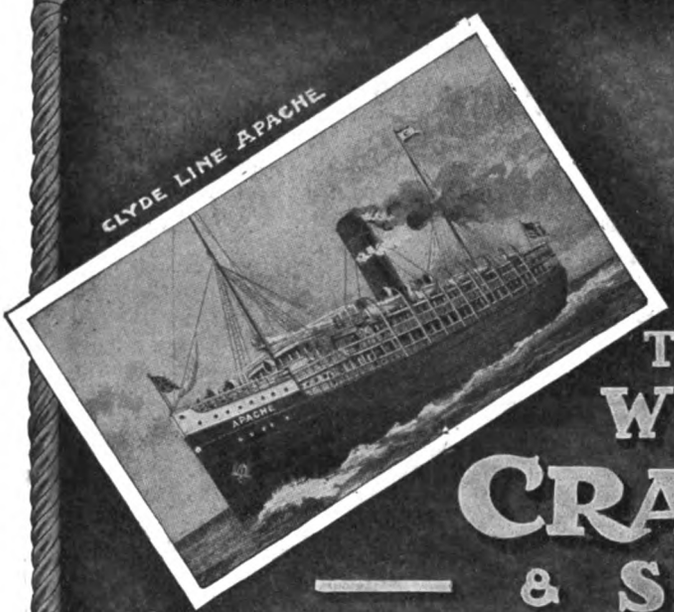

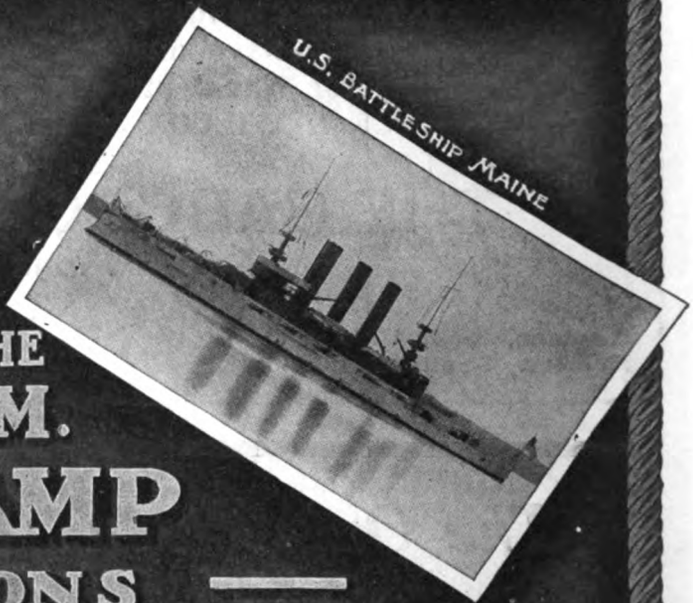

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Repairs to all classes
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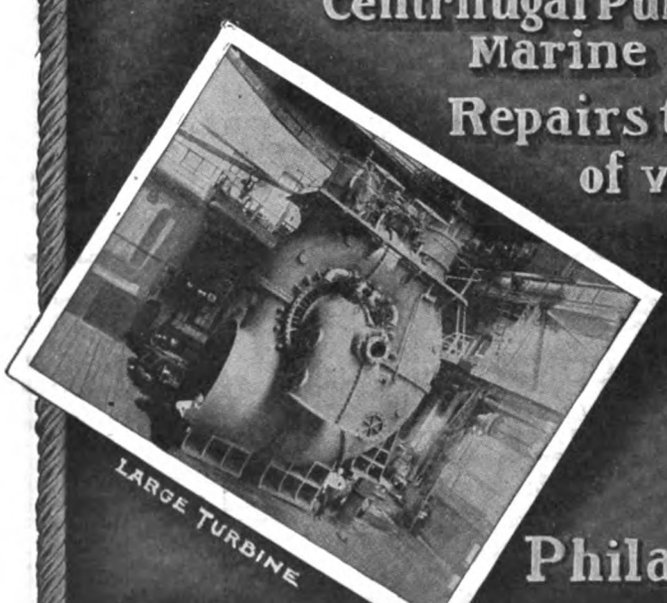

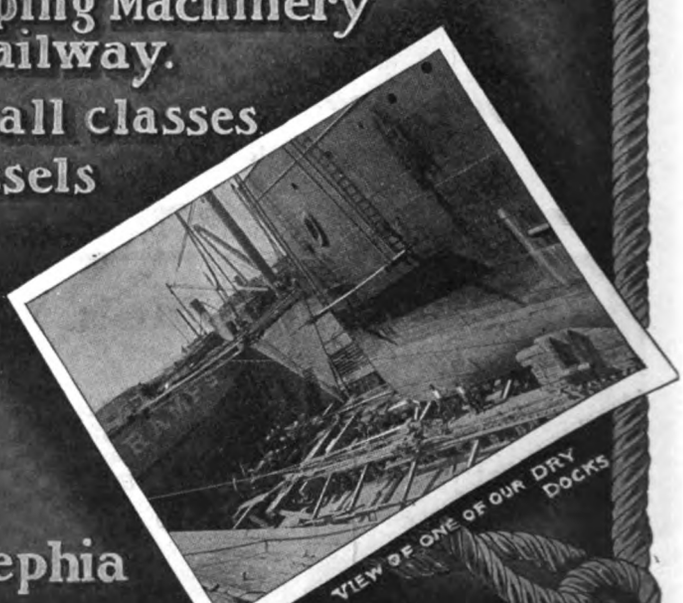

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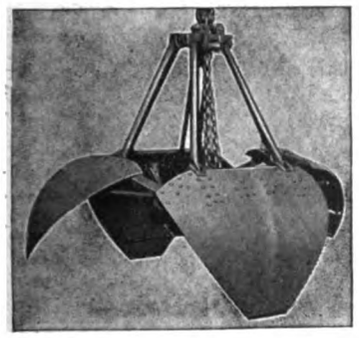

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Orange Peel and Clam Shell Types
for handling Coal, Iron Ore and Excavating

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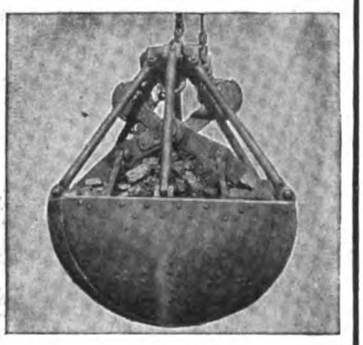

Orange Peel Closed showing load

THE STANLEY B. SMITH COAL AND DOCK CO.,
TOLEDO HARBOR, TOLEDO, OHIO.

1,800 Feet of Dock. 6 McMyler Derricks. Capacity 8,000 Tons Daily.

Fuel Lighters.—"KANAWHA." "PENNSYLVANIA." "HOCKING."

Docks.—PENNSYLVANIA R. R. —HOCKING VALLEY R. R. —TOLEDO AND OHIO CENTRAL R. R.

SMITH'S COAL DOCK, Detroit River, DETROIT, MICH.
12 Pockets. Platform. Low Dock.
Operated by STANLEY B. SMITH & CO.

MARINE SUPPLY COMPANY——STORE AND ICE HOUSE ON DOCK.

PITTSBURG COAL COMPANY

GENERAL OFFICE, LAKE DEPARTMENT, PERRY-PAYNE BUILDING, CLEVELAND, OHIO

Steamboat Fueling Facilities at Various Points on the Great Lakes

CLEVELAND HARBOR { 4 Car Dumpers. 3 Lighters. FAIRPORT HARBOR { 1 Car Dumper. 1 Lighter. ERIE HARBOR { 1 Car Dumper. Fuel Pockets.

ASHTABULA HARBOR { 1 Car Dumper. 1 Lighter. DETROIT RIVER BRANCH { Docks and Pockets at Sandwich and Amherstburg.

SAULT RIVER BRANCHES { Dock and Pockets at Detour. Dock and Pockets at Sault Ste. Marie. (The Port Royal Dock Co.)

WE FURNISH ONLY THE BEST GRADE OF

PITTSBURG AND YOUGHIOGHENY COAL

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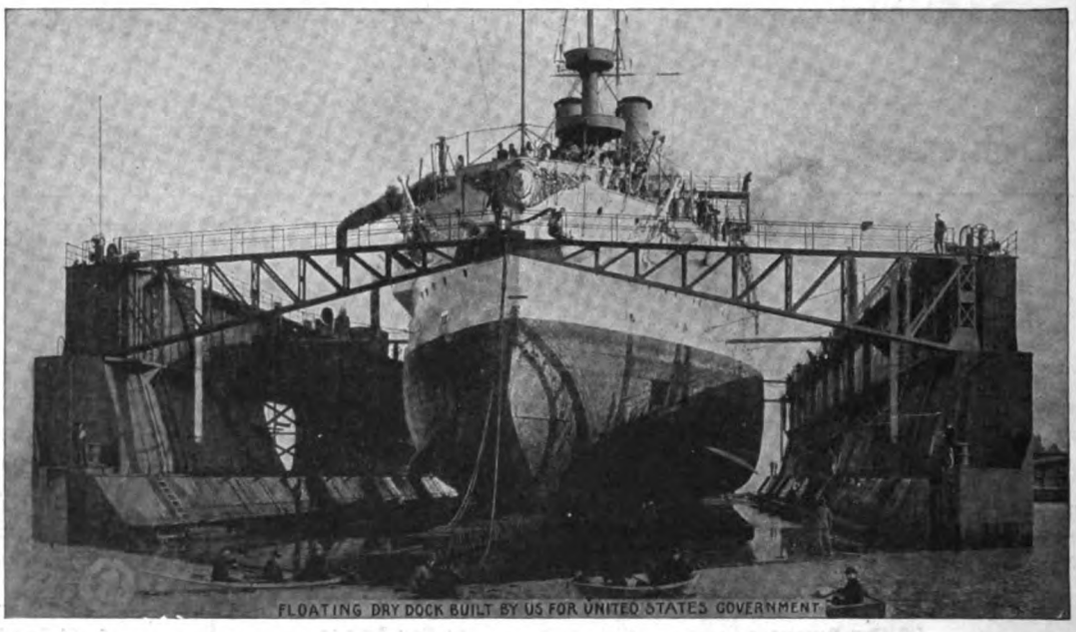
MARYLAND STEEL COMPANY

BUILDERS OF STEEL STEAMSHIPS, TOW BOATS, SAILING VESSELS, BARGES AND STEAM CRAFT OF EVERY DESCRIPTION

STEEL FLOATING DRY DOCKS CAPABLE OF DOCKING THE LARGEST VESSELS



FLOATING DRY DOCK BUILT BY US FOR UNITED STATES GOVERNMENT

SPARROW'S POINT, MARYLAND.

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THE NICLAUSSE BOILER.

The largest merchantmen in the world, the S. S. Minnesota and Dakota, of 33,000 tons and 11,000 H. P. each, are equipped with **Niclausse Boilers.**

641,000 HORSE POWER IN THE NAVIES OF ELEVEN NATIONS.

THE NEW JAPANESE CRUISERS, KATORI AND KASHIMA, OF 16,000 H. P. EACH, AND IN THE UNITED STATES NAVY THE ARMORED CRUISERS PENNSYLVANIA AND COLORADO, 23,000 H. P. EACH, AND THE BATTLESHIPS GEORGIA AND VIRGINIA, 19,000 H. P. EACH, WILL BE FITTED WITH THESE BOILERS.

THE ONLY WATER-TUBE BOILER SUCCESSFULLY USED AND PROVED IN LARGE SHIPS.

Requires no space at sides or rear—cleaned from the front.
Employs no tube-caps—tubes can readily be withdrawn without mutilation.
FORGED STEEL THROUGHOUT.

THE STIRLING COMPANY, General Offices, Trinity Building, NEW YORK.

The Owen Secret Bed

Solves the question of Bed Equipment for Boats, with the greatest economy of space, and perfect convenience and comfort.

A luxurious davenport with no ear-marks of bed combination, for use through the day. For the night—a complete comfortable bed entirely independent, with best bed springs, and regular full size removable mattress, always "made up" with all bed clothing ready for use.

No storing of bedding.
Perfect Ventilation.
Just like a stationary bed.

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The D. T. OWEN Company

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MADE IN GREAT VARIETY

WILL NOT SHAKE TO PIECES WHEN PLACED ON JARRING MACHINERY. WILL FEED OIL AT THE SAME RATE UNTIL CUP IS EMPTY.

IF YOUR LOCAL DEALER CANNOT FURNISH THEM, NOTIFY US.

THE LUNKENHEIMER COMPANY

Largest Manufacturers of Engineering Specialties in the World

MAIN OFFICES AND WORKS **Cincinnati, Ohio, U. S. A.**

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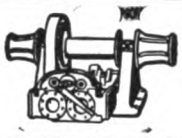
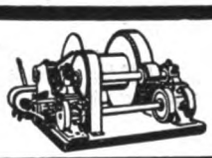
WE ALSO MANUFACTURE A COMPLETE LINE OF BRASS & IRON VALVES, WHISTLES, INJECTORS, COCKS, WATER COLUMNS, HYDROSTATIC & MECHANICAL LUBRICATORS, OIL & GREASE CUPS, ETC. 6 M. R.





GASOLENE MARINE ENGINES
Suitable for all Boats from 3½ to 200 H.P.
Over 100 in successful use.
Also the well known and always reliable Wootters Gas or Gasolene Stationary Engines.

HOISTING ENGINES
Of all kinds and sizes, and for all purposes, especially for ship use.
Docking and Hauling Engines and Wire Rope Windlasses.

AUTOMATIC TOWING MACHINES
Somewhat the cheapest, and altogether the best. Positively guaranteed.
Automatic Fog Whistle Machines
Steam Steering Engines.

FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO.

THE CHASE MACHINE CO. Engineers and Machinists. CLEVELAND, OHIO.

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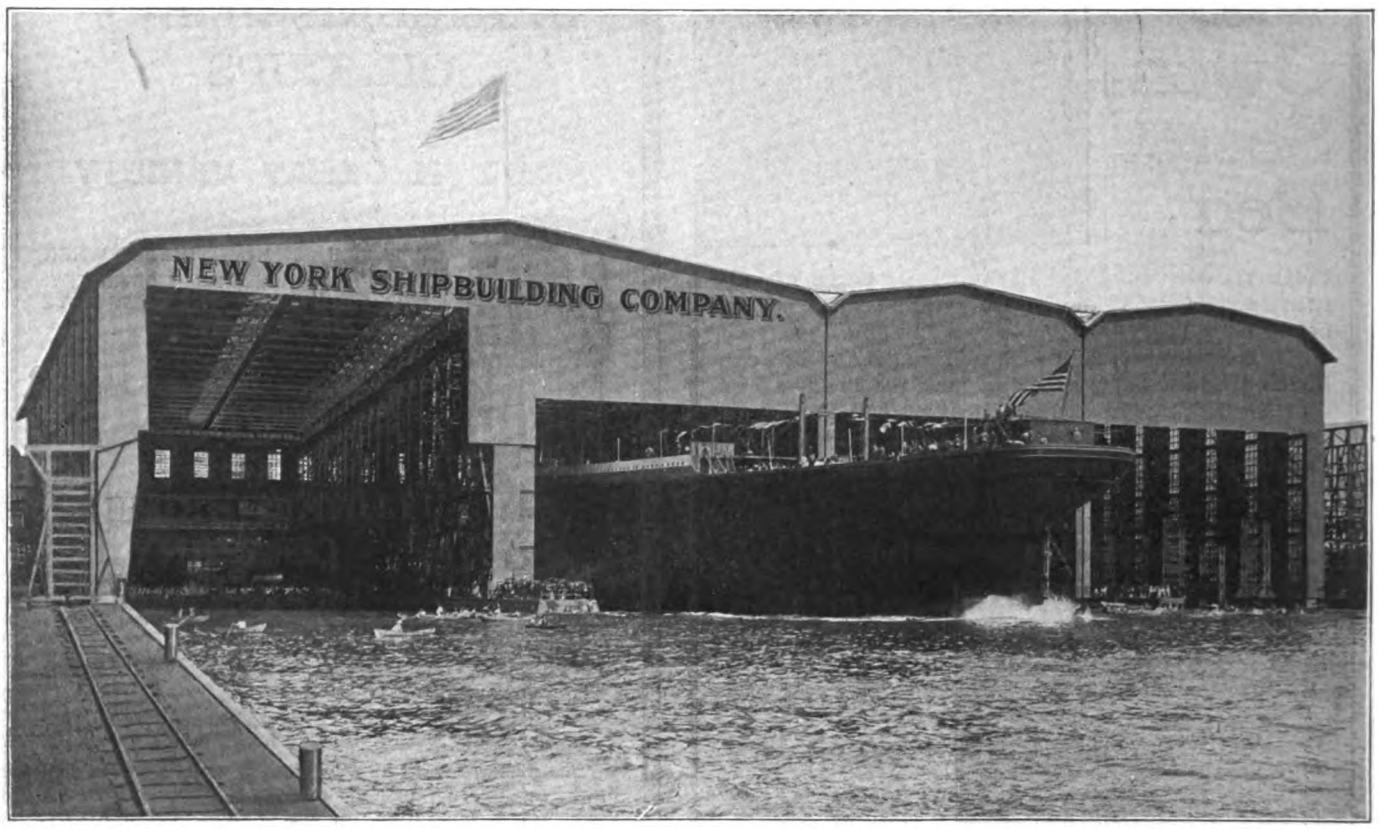
Builders of

SHIPS — ENGINES — BOILERS
HEAVY MACHINERY



Launch of "Mongolia," Pacific Mail S. S. Co., July 25, 1903.
615 feet long, 65 feet beam, 51 feet deep.

Best Facilities for Repair Work

Pneumatic and Electric Tools;
ample wharfage accomodation.

100 ton crane.

Repairs done under shelter.

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Commissioners' Sale

of the Shipbuilding Plant and other property of the William R. Trigg Co.

By N. W. BOWE & SON, Real Estate Auctioneers, Richmond, Va.

By virtue of a decree of the Chancery Court of the City of Richmond, Virginia, entered on the 23rd day of May, 1905, in the suit of S. H. Hawes & Co. vs. William R. Trigg Company et als., the undersigned, who were appointed Special Commissioners for that purpose, will proceed to sell, by public auction, on the premises, Richmond, Virginia, to the highest bidder, on

Monday, the Tenth Day of July, 1905, at 10 o'clock, a. m.

free of all liens and encumbrances whatsoever, except the easements and burdens hereinafter mentioned, all and singular the following estates, lands, properties, rights, privileges, and franchises, to-wit:

All that certain lot or parcel of land, with the buildings and improvements thereon erected, comprising the ship yards, ship building plant, boundaries, shops, railways, manufactories, offices, piers, wharves and docks of the William R. Trigg Co., situate in the city of Richmond, Virginia, more particularly described in two certain deeds of trust made by the William R. Trigg Co. to the Commercial Trust Co., of Philadelphia, trustee, dated June 1, 1901, and to the Richmond Trust & Safe Deposit Co., trustee, dated June 14, 1902, respectively.

The property will be first offered in parcels, as follows:

FIRST—The Richmond Dock, with all rights, easements, privileges and appurtenances thereto belonging, including the franchises of the Richmond Dock Co., together with so much real estate not covered by water as is necessary and appurtenant to its use, as set out and defined in deed dated the first day of June, 1901, from the Chesapeake & Ohio Railway Co. to the William R. Trigg Co., recorded in the clerk's office of the chancery court of the city of Richmond, deed book 171-A, page 245, and subject to the burdens and obligations fixed in said deed.

SECOND—Lot No. 1, with the two (2) office buildings thereon:

Lot No. 2, with the machine shop thereon, together with all the machinery, shafting, motors, cranes and hand and small tools now contained therein;

Lot No. 3, with the pattern shop thereon, together with all machinery, shafting, motors and hand and small tools now contained therein;

Lot No. 4, with the foundry building thereon, together with all machinery, shafting, motors, cranes, cupolas and hand and small tools now contained therein;

Lot No. 5, with the Smith shop thereon, together with all machinery, shafting, motors, cranes and hand and small tools now contained therein;

Lot No. 6, with the bending shed and anglesmith shop thereon, together with all machinery, shafting, motors and hand and small tools now contained therein;

Lot No. 7, with the mold loft thereon, together with all machinery, shafting, motors and hand and small tools now contained therein;

Lot No. 8, with the shipfitters' shed thereon, together with all machinery, shafting, motors and hand and small tools now contained therein;

Lot No. 9, with the carpenter and joiner shop thereon, together with all machinery, shafting, motors and hand and small tools now contained therein;

Lot No. 10, being a vacant piece or parcel of land containing three (3) acres, more or less, lying between the Smith shop and the bending shed;

Lot No. 11, being all of the unoccupied real estate lying east of lot No. 9, and containing fourteen (14) acres, more or less, on which said lot is located a launching basin and ship lock.

The exact location, together with their metes and bounds, of the aforesaid tracts of land will appear from the plats in the possession of the undersigned special commissioners and the auctioneer, access to which is open to the public, and blue prints of which will be furnished to any party applying for the same.

THIRD—The said special commissioners will then proceed to offer separately each of the aforesaid lots of land, with the buildings thereon as above indicated, *without* the machinery, tools, etc., contained therein, but with the appliances for electric lighting, wiring for power, automatic sprinklers and heating appliances.

FOURTH—The machinery, shafting, motors, cranes and hand and small tools contained in each of the aforesaid buildings in separate parcels, and distinct from the buildings.

FIFTH—All cranes, cableways, shear legs, derricks and other machinery and yard equipment outside of the aforesaid buildings, including a floating machine shop and a floating derrick.

SIXTH—All of the real estate comprising the plant of the William R. Trigg Co., except the dock with its appurtenances as above described, containing about 30 acres, more or less, together with the buildings thereon.

All of the above real estate, including the aforesaid dock, is sold subject to certain easements, rights, licenses, and privileges reserved by the Chesapeake & Ohio Railway Co. in two certain deeds conveying portions of the aforesaid property to said William R. Trigg Co., dated the 1st of June, 1901, and recorded in the clerk's office of the chancery court of the city of Richmond, in deed book 171-A, pages 245 and 258, and subject to certain easements, rights, licenses and privileges set out in two certain deeds between said William R. Trigg Co. and the Southern Railway, each dated the 21st day of November, 1904, recorded in the aforesaid clerk's office in deed book 183-B, pages 315 and 320.

SEVENTH—The said special commissioners will then proceed to offer as a whole the aforesaid land, dock, buildings, machinery, fixtures, equipment and property of every sort, kind and description above referred to, reporting to the court for its acceptance or rejection, the bid or bids aggregating the largest amount of purchase money.

TERMS—The terms of said sale, in the event that the said property is sold as a whole, are as follows: $50,000 in cash, of which $10,000 shall be paid to the said special commissioners by the purchaser or purchasers on the date of said sale, and $40,000 when said sale shall have been confirmed by the court; the balance of the purchase money on equal credits of one, two and three years, the purchaser to execute negotiable notes, bearing interest from the date of the confirmation of said sale, for the deferred payments; with the right in the purchaser to pay the whole amount of purchase money in cash, and to anticipate the due date of any or all of said notes. The title to the property to be retained by the court until the whole of the purchase price is paid, and a deed directed to be executed to the purchaser.

If sold in parcels, then the following are the terms: As to all articles of personal property, or property removable under said decree, all cash; as to the real estate, or any parts thereof, one-fourth of the purchase price in cash, and the balance on equal credits of one, two and three years, the deferred payments being evidenced by purchaser's notes, bearing interest from date of confirmation of sale, with the right in the purchaser to anticipate the due date of any or all of said notes, and title to be retained until the entire purchase money is paid and conveyance ordered by the court.

For further information apply to either of the undersigned Special Commissioners or to the Auctioneer.

BEVERLEY B. MUNFORD
LILBURN T. MYERS } Special Commissioners.

The bond required of the Special Commissioners by the above named decree has been duly executed.

CHARLES O. SAVILLE,
Clerk of the Chancery Court of the City of Richmond.

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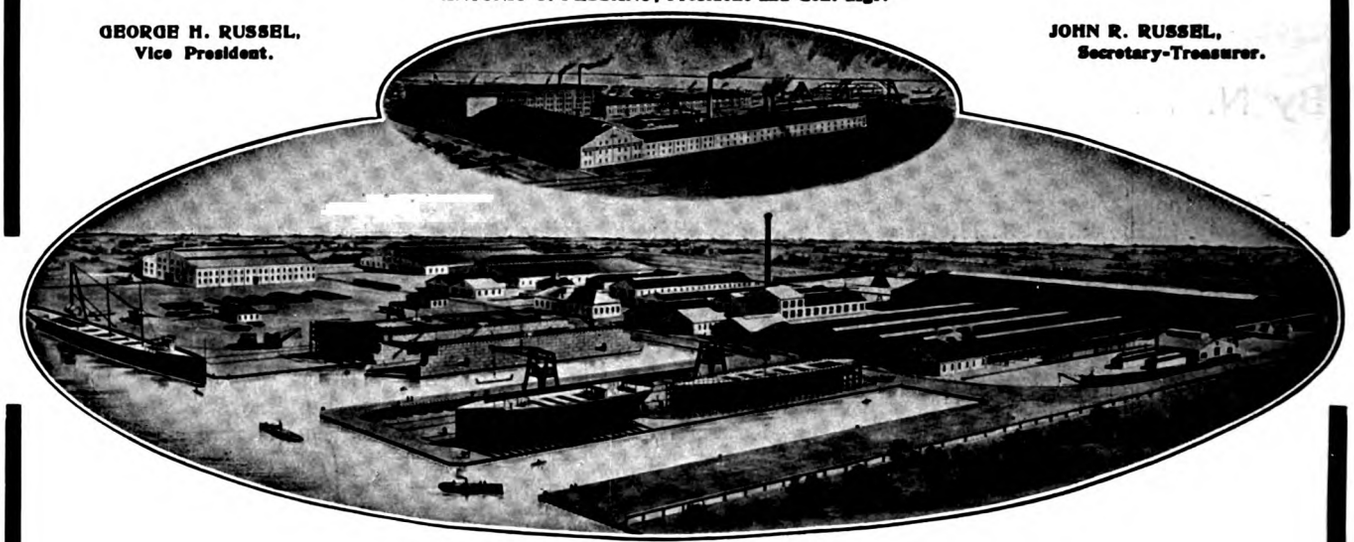
DETROIT, MICH.

ANTONIO C. PESSANO, President and Gen. Mgr.

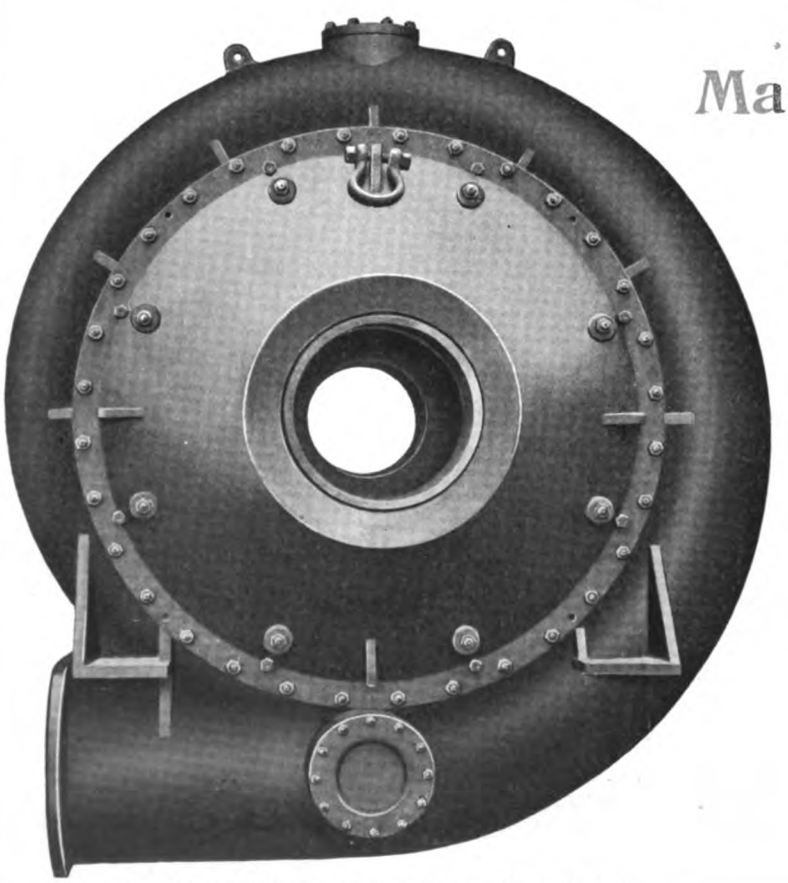
GEORGE H. RUSSEL, Vice President.

JOHN R. RUSSEL, Secretary-Treasurer.



Steel Ship Builders

Floating Dock



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Centrifugal Pumps for Hydraulic Dredging, etc.

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NOW IN USE (MARCH, 1905)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

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English Royal Navy	966,300 "
Russian Imperial Navy	253,800 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	56,700 "
Italian Royal Navy	32,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Compagnie Generale Transatlantique	1,500 "
Total Horse Power of Boilers in Use	1,939,660

Societé Anonyme des Etablissements Delaunay Belleville

CAPITAL: 6,000,000 FRANCS

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IRON, STEEL
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Cam Lever Pop Safety Valves and Non-Corrosive Steam Gauges.

give highest efficiency and durability. Specify them and get the best.

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Buyers' Directory of the Marine Trade

For a more complete classification than that represented by advertisers in the Marine Review, see the BLUE BOOK OF AMERICAN SHIPPING, marine and naval directory of the United States, published by The Marine Review, Cleveland.

See accompanying index of Advertisers for full addresses of concerns in this directory.

AIR COMPRESSORS, AIR HOISTS, ETC.
Great Lakes Engineering Works.....Detroit.
Mietz, Aug. .....New York.

AIR PORTS, DEAD LIGHTS, ETC.
Marine Mfg. & Supply Co.....New York.

AIR PUMPS AND APPLIANCES.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.

ANCHORS.
Bowers, L. M. & Co.....Binghamton, N. Y.
Seaboard Steel Casting Co.....Chester, Pa.

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Holzapfel's American Composition Co....
.....New York.

ANTI-FRICTION METALS.
Cramp, Wm. & Sons.....Philadelphia.

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Great Lakes Engineering Works.....Detroit
Sturtevant, B. F., Co.....Hyde Park, Mass.

ASH EJECTORS.
Great Lakes Engineering Works.....Detroit.

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Hoyt, Dustin & Kelley.....Cleveland.
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Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Potter & Potter.....Buffalo.
Shaw, Warren, Cady & Oakes.....Detroit.
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Owens Co., D. T.....Cleveland.

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Link Belt Machinery Co.....Chicago.

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Cleveland Block Co.....Cleveland.

BLOWERS.
Power Specialty Co.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

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Kahnweiler's Sons, David.....New York.
Lane & DeGroot....Long Island City, N. Y.
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.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

BOILER CLEANING DEVICE.
Power Specialty Co.....Detroit.

BOILER COMPOUNDS.
Dearborn Drug & Chemical Works....Chicago.

BOILER MANUFACTURERS.
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American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Babcock & Wilcox Co.....New York.
Bertram Engine Works Co., Ltd.....
.....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Cramp, Wm. & Sons.....Philadelphia.
Dearing Water Tube Boiler Co.....Detroit.
Delauney, Belleville & Co...St. Denis, France.
Detroit Ship Building Co.....Detroit.
East End Boiler Works.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Georgian Bay Engineering Works.....
.....Midland, Ont.
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Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co....
.....Duluth, Minn.
Roberts Safety Water Tube Boiler Co....
.....New York.
Stirling, The Co.....New York.
Superior Ship Building Co.....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

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Bourne-Fuller Co.....Cleveland.

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Woodhouse Chain Works.....Trenton, N. J.

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General Electric Co.....Schenectady, N. Y.

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Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.

ELECTRIC HOISTS AND CRANES.
General Electric Co.....Schenectady, N. Y.

ELECTRIC LIGHT AND POWER PLANTS.
General Electric Co.....Schenectady, N. Y.
Mietz, Aug.....New York.
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

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WANTED and FOR SALE Department.

PROPOSALS.

U. S. Engineer Office, Jones Building, Detroit, Mich., May 22, 1905. Sealed proposals for hire of one dredging plant and one steam derrick boat for use in St. Mary's River, Michigan, will be received here until 2 P. M. June 22, 1905, and then publicly opened. Information furnished on application. CHAS. E. L. B. DAVIS, Lieut.-Col., Engineers. June 15

PROPOSALS FOR CONSTRUCTING BREAKWATER.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 20, 1905. Sealed proposals for constructing the Shoreward End of the West Breakwater at Ashtabula Harbor, Ohio, will be received at this office until 2 P. M., June 19, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut.-Col. Corps of Engineers, U. S. A. June 15.

U. S. Engineer Office, Jones Building, Detroit, Mich., May 20, 1905. Sealed proposals for dredging in St. Mary's River, at Bayfield Shoal and Entrance Angle to Middle Neebish, will be received here until 2 P. M., June 20, 1905, and then publicly opened. Information furnished on application. CHAS. E. L. B. DAVIS, Lieut.-Col. Engineers. June 15

U. S. Engineer Office, Duluth, Minn., May 27, 1905.—Sealed proposals for pile dike and riprap at Grand Marais, Mich., will be received here until noon, June 26, 1905, and then publicly opened. Information on application. CHAS. L. POTTER, Major, Engrs. June 22

U. S. Engineer Office, Duluth, Minn., May 27, 1905.—Sealed proposals for dredging about 117,000 yards in Portage Lake Ship Canals, Keweenaw Point, Michigan, will be received here until noon, June 27, 19051, and then publicly opened. Information on application. CHAS. L. POTTER, Major, Engrs. June 22

PROPOSALS.

U. S. ENGINEER OFFICE, Montgomery, Ala., May 31, 1905. Sealed proposals for dredging "Link Channel," Apalachicola Bay, Fla., and Carrabelle Bar, Fla., will be received here until noon July 1, 1905, and then publicly opened. Information furnished on application. J. B. CAVANAUGH, Capt. Engrs. June 29

PROPOSALS FOR CONSTRUCTING BREAKWATER.—U. S. Engineer Office, 262 Huron street, Cleveland, Ohio, May 31, 1905. Sealed proposals for reconstructing and repairing parts of the west pier at Lorain harbor, Ohio, will be received at this office until 2 p. m., June 20, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col., Corps of Engineers, U. S. A.

FOR SALE.

For Sale.

Two 10 K. W. direct connected electric dynamos and engines, 125 volt, for marine work; good condition; cheap. JORDAN BROS., 74 Beekman St., New York.

Books for Sale.

Library of naval architecture for sale. Write for list of books and prices. Address: BOOKS, 167 Buffalo Ave., Niagara Falls, N. Y.

FOR SALE.

Dock Lease for Sale.

Long lease of valuable dock at Sault Ste. Marie, Mich. Will sell or rent for long or short term. F. R. Warner, Trustee, Sault Ste. Marie, Mich.

Scotch Marine Boilers.

Four new, Scotch Marine Boilers, 10 ft. diameter and 11 ft. long. Will pass inspection for 200 lbs. working pressure. Quick delivery. Low price. Address B. M., care Marine Review, Cleveland.

The Steamer Gordon Campbell.

Burned on spar-deck—easy to cut down to lumber barge, to carry million feet. Machinery and boilers untouched. Hull untouched and in good condition. Boat in dry dock and thoroughly overhauled last summer. Can be seen in Chicago. Want best offer. Address Room 613, 59 Dearborn St., Chicago. t f

Steel Tug for Sale.

70 ft. long; 15 ft. beam and 7 ft. deep. Marine fire box. boiler 150 lbs. steam; Sutton engine 12 x 14. Built in 1901. Address Wm. Tallman, 262 W. 3rd street, Erie, Pa.

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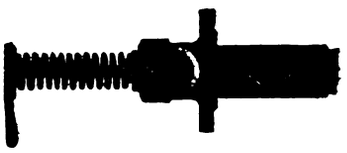

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Windsor, Canada. Berlin, Germany.

FOR SALE.

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For Sale.—One 50 H. P. Scotch Marine Boiler, 10 ft. long, 78 in. diameter, 160 lbs. steam pressure. Manufactured by Ritter & Co., Buffalo, N. Y. In first-class shape. For particulars, write The Detroit Stove Works, Detroit, Mich. t. f.

For Sale.

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A device in the form of an air buoy for definitely locating sunken vessels. Should the vessel sink upon which this buoy is placed, the buoy floats, and a line, made fast in a separate compartment, unreels until the vessel strikes bottom, thereby locating the exact position of the sunken vessel. This buoy is also adapted for use as a mooring buoy for yachts of all sizes, and for all floating property. It can be manufactured and sold for much less than any other buoy in use. Will sell the patent for cash or exchange for vessel or other property. Address, Capt. J. Fred Tribble, 59 Broadway, Norwich, Conn. t.f.

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Buyers' Directory of the Marine Trade.—*Continued.*

ENGINE BUILDERS, MARINE.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bertram Engine Works Co., Ltd.....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co....Quincy, Mass.
Great Lakes Engineering Works.Detroit, Mich.
Hall Bros.....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Mich.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.
Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

ENGINE TESTING.
Kreer & Parsons.....Chicago.

ENGINEERING SPECIALTIES AND SUPPLIES.
Crane Co.....Chicago.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
New York Belting & Packing Co..New York.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.
Hynd, Alexander.....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O.....Buffalo.
Mosher, Chas. D.....New York.
Nacey, James.....Cleveland.
Rice, Henry.....Buffalo.
Roelker, H. B.....New York.
Wood, W. J.....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.
Sturtevant, B. F. Co.....Hyde Park, Mass.

FEED WATER PURIFIERS AND HEATERS.
Greacen-Derby Engineering Co.....Perth Amboy, N. J.
Ross Valve Co.....Troy, N. Y.

FIRE EXTINGUISHERS.
Safety Fire Extinguisher Co.....New York.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.
General Electric Co.....Schenectady, N. Y.

FORGES.
Sturtevant, B. F. Co.....Boston.
Sutton Co., C. E.....Toledo, O.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.
Cleveland City Forge & Iron Co...Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.
Fix's, S. Sons.....Cleveland.

FUEL ECONOMIZERS.
Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.
Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

FUELING PLANTS, BUILDERS OF
Link Belt Machinery Co.....Chicago.

FURNACES FOR BOILERS.
Continental Iron Works.....New York.

GAS BUOYS.
Safety Car Heating & Lighting Co..New York.

GAS AND GASOLINE ENGINES.
Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....Midland, Ont.

GAUGES, STEAM AND VACUUM.
Ashton Valve Co.....Boston.
Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.
Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati, O.

GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J

GREASE EXTRACTORS.
Greacen-Derby Engineering Co.....Perth Amboy, N. J.

HAMMERS, STEAM.
Chase Machine Co.....Cleveland.

HEATING APPARATUS.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Sutton Co., C. E.....Toledo, O.

HOISTS FOR CARGO, ETC.
American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.).....Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug.....New York.

HOLLOW SHAFTINGS, IRON OR STEEL.
Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOLLOW STAYBOLT IRON.
Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOSE, RUBBER.
New York Belting & Packing Co..New York.

HYDRAULIC DREDGES.
Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.
Watson-Stillman Co., The.....New York.

ICE MACHINERY.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.
Ashton Valve Co.....Boston.

INJECTORS.
American Injector Co.....Detroit.
Crane Co.....Chicago.
Jenkins Bros.....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON CASTINGS.
Sutton Co., C. E.....Toledo, O.

IRON ORE AND PIG IRON.
Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.
Georgian Bay Engineering Works.....Midland, Ont.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Winthrop Harbor, Ill.

LIFE PRESERVERS, LIFE BOATS, BUOYS.
Armstrong, Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Gaynor, T. F.....New York.
Kahnweiler's Sons, D.....New York.
National Cork Co.....Brooklyn.

LIGHTS, SIDE AND SIGNAL.
Russell & Watson.....Buffalo.

LOGS.
Nicholson Ship Log Co.....Cleveland.
Walker & Sons, Thomas....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.
Crane Co.....Chicago.
Lunkenheimer Co.....Cincinnati.

LUMBER.
Martin-Barriss Co.....Cleveland.

MACHINISTS.
Chase Machine Co.....Cleveland.
Hickler Bros.....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).
Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.
Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.
Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.
Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.
American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.
Katzenstein, L. & Co.....New York.

METAL POLISH.
Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.
Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.

NAUTICAL INSTRUMENTS.
Ritchie, E. S., & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.
Hynd, Alexander.....Cleveland.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James.....Cleveland.
Rice, Henry.....Buffalo.
Wood, W. J.....Chicago.

OAKUM.
Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.
Mietz, Aug.....New York.

OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.
Crane Co.....Chicago.
Jenkins Bros.....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co..New York.

PAINTS.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

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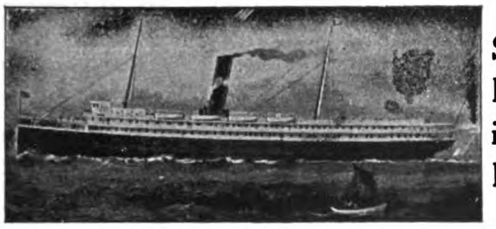
ROACH'S SHIP YARD.



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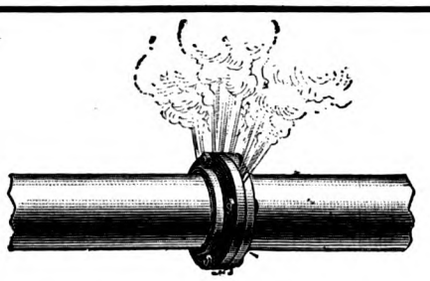

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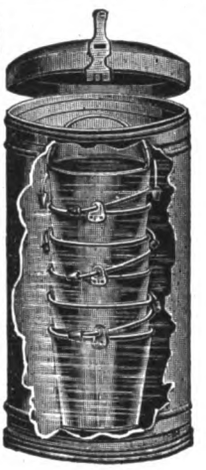

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SAFETY FIRE EXTINGUISHER CO.
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The C. E. Sutton Company
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Buyers' Directory of the Marine Trade.—*Continued.*

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Great Lakes Dredge & Dock Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co. ..... Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M..... Detroit

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PRESSURE REGULATORS.

Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co.....Bath, Me.
Lockwood Mfg. Co. .....East Boston, Mass.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Marine Iron Works.....Chicago.
Kingsford Foundry & Machine Works.... .....Oswego, N. Y.

PUNCHES AND SHEARS.

Sutton Co., C. E.....Toledo, O.

RANGES.

Stamford Foundry Co.....Stamford, Conn.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works..... .....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.

Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.

SHAFTING, HOLLOW.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.

SHEARS.

See Punches, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Roach's Ship Yard.....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.

Kidd, Joseph .....Duluth.
Kreer & Parsons .....Chicago.
Matteson & Drake .....Buffalo.
Rice & Lovejoy .....Buffalo.
Steel, Nacey & Hynd.....Cleveland.
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.

Russell & Watson.....Buffalo.

SHIPMATE RANGES.

Stamford Foundry Co.....Stamford, Conn.

SHIP TIMBER.

Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLT IRON OR STEEL BARS, HOLLOW OR SOLID.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Gilchrist & Co., C. P.....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
Cleveland & Buffalo Transit Co.....Cleveland.
International Mercantile Marine Co..... ..... Philadelphia.
Mallory Line ....New York.
Merchants' Montreal Line.....Montreal.
New York & Cuba Mail S. S. Co...New York.
Red Star Line.....New York.
United Fruit Co.....Bostor

STEEL CASTINGS.

Otis Steel Co.....Cleveland.
Sutton Co., C. E.....Toledo, O.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.
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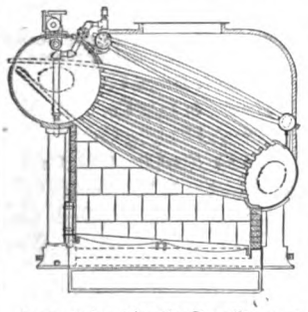

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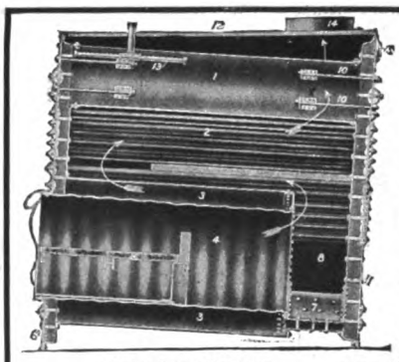

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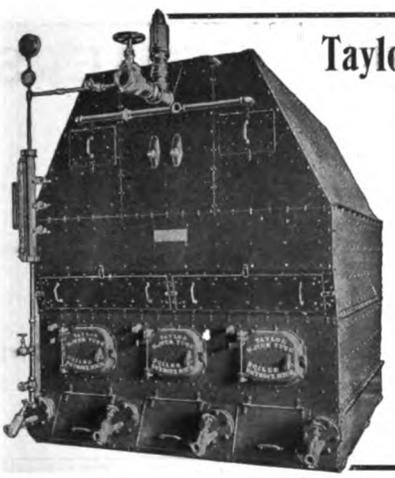

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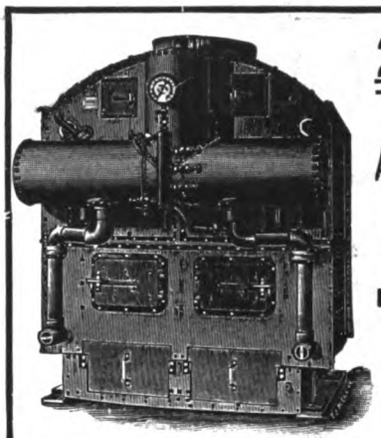

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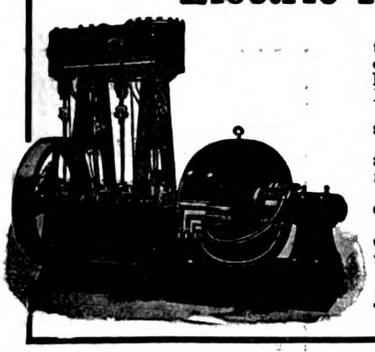

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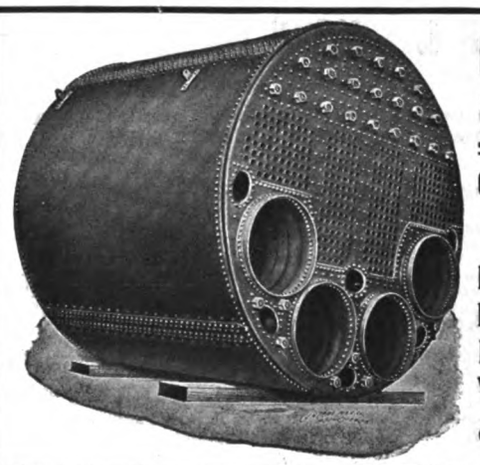

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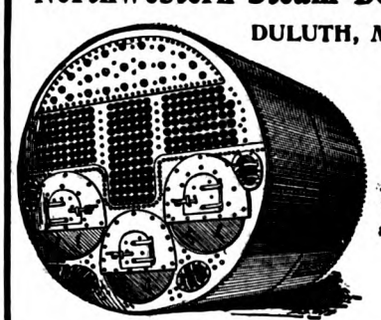

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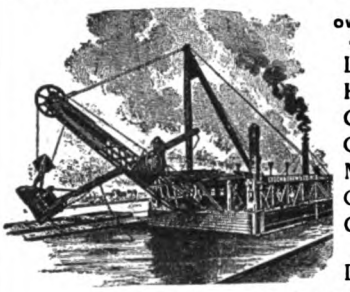

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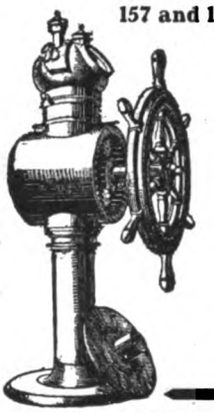

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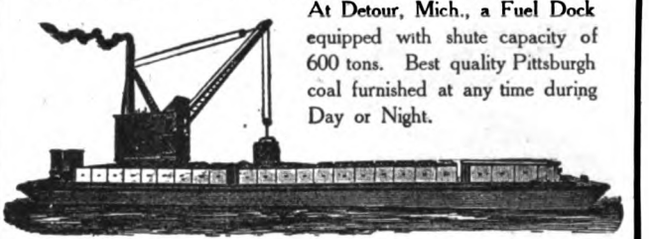

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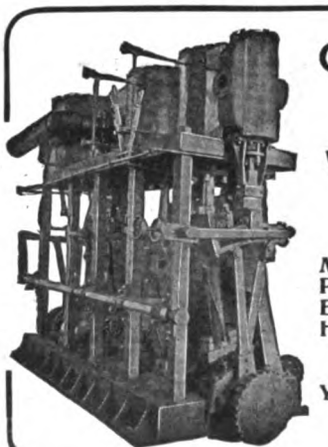

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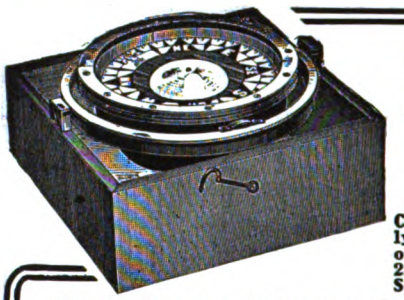

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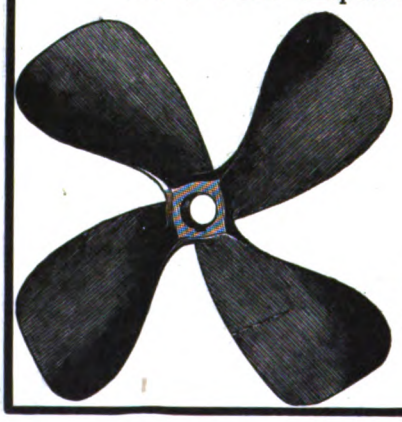

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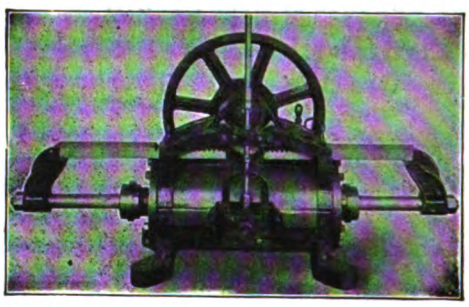

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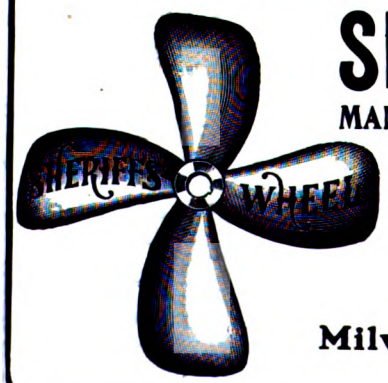

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ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.
The dagger (†) indicates that advertisement appears once a month.

Almy Water Tube Boiler Co..... 41
American Injector Co..... 3
American Line..... 45
American Ship Building Co..... 4
American Ship Windlass Co..... 2
Armstrong Cork Co..... 52
Ashton Valve Co..... 35
Atlantic Works..... 49
Atlantic Works, Inc ..... †

Babcock & Wilcox Co..... 7
Baker, Howard H. & Co..... 52
Bertram Engine Works Co., Ltd.. 47
Blake, Geo. F., Mfg. Co..... 48
Boland, J. J..... 46
Bonner & Co., Wm. T ..... †
Boston & Lockport Block Co..... 2
Boston Steamship Co..... 45
Bourne-Fuller Co..... 35
Bowers, L. M. & Co 41
Breymann & Bros., G. H..... 42
Brown Hoisting Machinery Co., Inc. 2
Buffalo Dredging Co..... 42
Buffalo Dry Dock Co..... 5
Bunker, Edw. A..... 39

Carroll Wm. F..... 46
Chase Machine Co 11
Chicago Ship Building Co..... 4
Clapham & Clapham 47
Cleveland & Buffalo Trans.Co ... 44
Cleveland City Forge & Iron Co.. 50
Continental Iron Works 2
Cory, Chas. & Son..... 50
Cowing, John P 5
Craig Ship Building Co 5
Cramp, Wm. & Sons, S. & E. B. Co..... 8
Crandall & Son, H. I. ..... *
Crane Co.....48-50

Dearborn Drug & Chemical Wks. 9
Delaunay, Belleville & Co..... 35
Delaware River Iron S. B. & E. Works..... 39
Detroit Ship Building Co. 4
Dixon Crucible Co., Joseph..... 44
Donnelly Salvage & Wrecking Co. 47
Drein, Thos. & Son..... 47
Dunbar & Sullivan Dredging Co. 42

East End Boiler Works..... 41
Elphicke, C. W. & Co..... 46

Falls Hollow Staybolt Co. 48
Fitz-Simons & Connell Co 42
Fix's Sons, S..... 50
Fleming & Co., E. J..... 46
Fletcher Co., W. & A 48
Fogg, M. W..... 50
Fore River Shipbuilding Co 48

Gaynor, T. F 47
General Electric Co..... 52
Georgian Bay Engineering Wks.. *
Gilchrist, Albert J 46
Gilchrist & Co., C. P..... 46
Goulder, Holding & Masten 46
Great Lakes Dredge & Dock Co... 42
Great Lakes Engineering Works 14
Great Lakes Register..... 48
Great Lakes Towing Co..... *

Hall, John B. 46
Hanna & Co., M. A..... 43
Hawgood & Co., W. A..... 46
Helm & Co., D. T..... 46
Hickler Bros..... 42
Holmes, Samuel 46
Hoyt, Dustin & Kelley..... 46
Hunt & Co., Robert W..... 47
Hutchinson & Co..... 46
Hyde Windlass Co..... 13

International Mercantile Marine Co..... 45
Ironville Coal and Dock Co..... 43

Jenkins Brothers..... 52
Jenkins, Russell & Eichelberg.... 46

Kahnweiler's Sons, David 50
Katzenstein & Co., L..... 45
Kidd, Joseph 47
Kieley & Mueller..... *
Kingsford Foundry & Machine Works 41
Kreer & Parsons 47
Kremer, C. E 46

Lake Superior Contracting & Dredging Co..... 42
LeMois Scientifique et Industrial *
Lester, S. S..... 46
Link Belt Machinery Co 51
Lockwood Mfg. Co 39
"Long Arm" System Co ..... †
Lovejoy, H. O..... 47
L. S. & M. S. Ry..... 51
Lunkenheimer Co..... 11

McCarthy, T. B. 46
McCurdy, Geo. L..... 35
McMyler Mfg. Co..... 43
MacDonald, Ray G 46
Mallory Line..... 45
Marine Iron Co., Bay City, Mich. *
Marine Iron Works 3
Marine Mfg. & Supply Co..... 43
Martin-Barriss Co 44
Maryland Steel Co..... 10
Mayo & Bailey 9
Merchants' Montreal Line..... 44
Mietz, Aug ..... †
Milwaukee Dry Dock Co..... 5
Mitchell & Co..... 46
Morse & Son, A. J 50
Mosher Water-Tube Boiler Co... 41
Moulton Steering Engine Co 44

Nacey & Hynd 47
National Cork Co..... 47
Newport News Ship Building & Dry Dock Co 6
New York & Cuba Mail S. S. Co.. 45
New York Shipbuilding Co. ... 12
Nicholson Ship Log Co. 52
Northwestern Steam Boiler & Mfg Co. 41

Otis Steel Co 49
Owen Co., D. T..... 11

Parker Bros. Co..... 46
Peck, Chas. E. & W. F 48
Penberthy Injector Co..... 3
Pickands, Mather & Co..... 43
Pittsburg Coal Co 9
Potter, J. D..... 47
Power Specialty Co..... *
Prindiville & Co..... 46

Red Star Line..... 45
Rice, Henry..... 47
Richardson, W. C 46
Ritchie & Sons, E. S 44
Roberts Safety Water-Tube Boiler Co 47
Roelker, H. B..... 39
Ross Valve Co 50

Safety Car Heating & Lighting Co 7
Safety Fire Extinguisher Co. 39
Scherzer Rolling Lift Bridge Co 44
Schrader's Son, A 50
Shaw, Warren, Cady & Oakes... 46
Shelby Steel Tube Co ..... *
Sheriffs Mfg. Co..... 44
Shipping World ..... *
Shipowners' Dry Dock Co..... 39
Smith & Son, Abram 47
Smith Co., L. P. & J. A 42
Smith Coal & Dock Co.. Stanley B 9
Smith, Stanley B., & Co 9
Smooth-On Mfg. Co..... 41
Stamford Foundry Co..... 3
Standard Oil Co ..... *
Starke Dredge & Dock Co., C. H. 43
Stirling Co 11
Stratford Oakum Co., Geo 44
Sturtevant, B. F. Co 52
Sullivan, M..... 43
Sullivan & Co..... 46
Superior Ship Building Co..... 4
Sutton Co., C. E..... 39

Taylor Water-Tube Boiler Co.... 41
Thropp, J. E. & Sons Co..... 41
Trout, H. G 44
Truscott Boat Mfg Co 7

United Fruit Co..... 45
Upson-Walton Co..... 52

Walker, Thomas & Son..... 2
Ward Line..... 45
Watson-Stillman Co..... 51
White, Johnson, McCaslin & Cannon 46
Willard, Chas. P. & Co. 43
Wood, W. J..... 47
Woodhouse Chain Works..... 7

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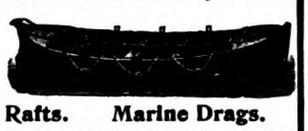

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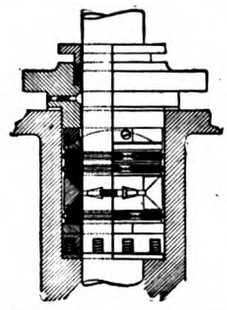

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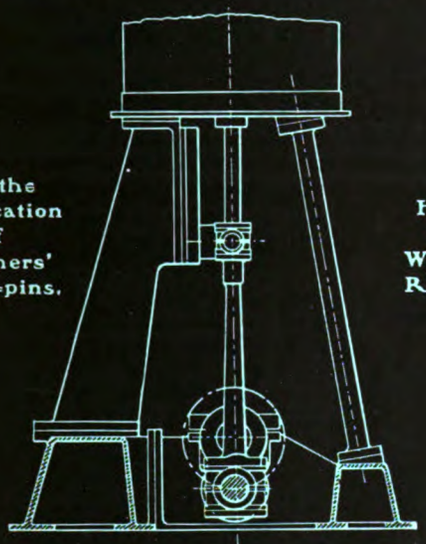

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No. 20, Chicago and Cleveland Exp.	*7:20 a.m.	.....
No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston–New York Express	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl.	.....	*3:00 p.m.
No. 46, Southwestern Express	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....

Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No. 9, Day Express	.....	†6:00 a.m.
No. 15, Boston and Chicago Special	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	‡11:10 a.m.	.....
No. 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp.	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p.m.
No. 141, Sandusky Accommodation	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation	.....	†5:10 p.m.
No. 37, Pacific Express	*6:50 p.m.	*7:20 p.m.
No. 3, Fast Mail Limited	*10.50 p.m.	*10:55 p.m.
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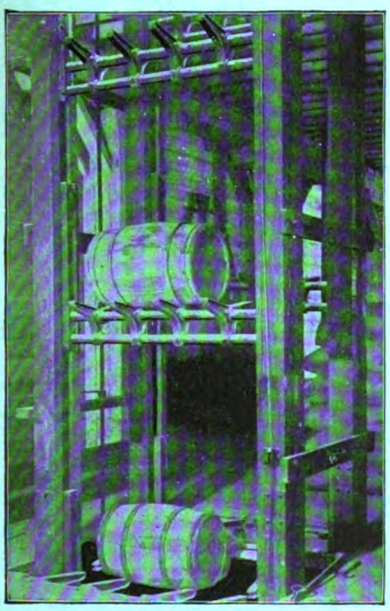
*Daily. †Ex. Sunday. ‡Ex. Monday. Nos. 23, 28 and 37 run via Erie Station. City Ticket Office. 237 Superior St



Photograph showing one of two suspended tray elevators handling miscellaneous freight in warehouse of the Chicago, Milwaukee & St. Paul Ry. Co., Chicago, installed in 1887, and constantly operated for sixteen years, practically without repairs.

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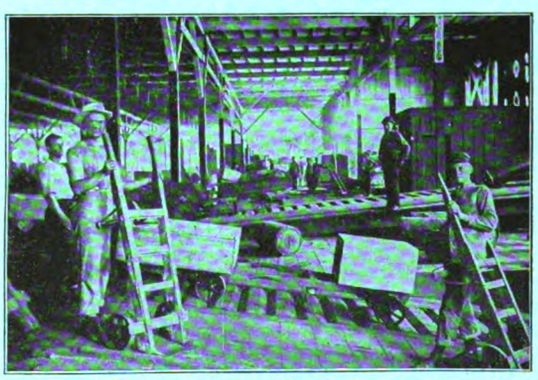

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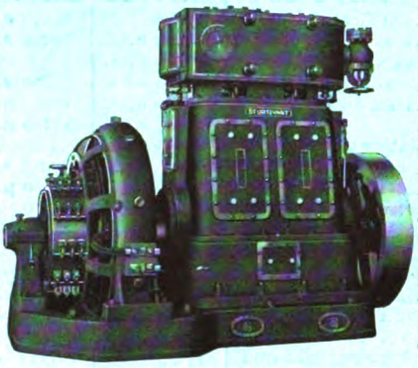

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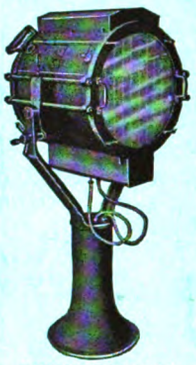

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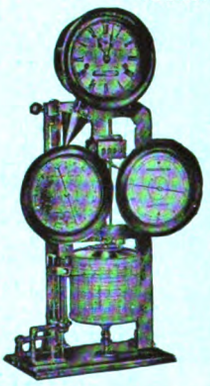

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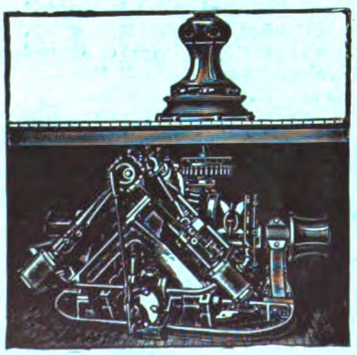

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